

OBSTETRIC NURSING

FULLERTON



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A HANDBOOK
OF
OBSTETRIC NURSING
FOR
NURSES, STUDENTS AND MOTHERS

COMPRISING THE COURSE OF INSTRUCTION IN OBSTETRIC NURSING
GIVEN TO THE PUPILS OF THE TRAINING SCHOOL FOR
NURSES CONNECTED WITH THE WOMAN'S
HOSPITAL OF PHILADELPHIA

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WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA; LATE LECTURER
ON SURGERY AND OPERATIVE MIDWIFERY IN THE
NORTH INDIA SCHOOL OF MEDICINE FOR WOMEN

SEVENTH REVISED EDITION. ILLUSTRATED

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THIS LITTLE BOOK IS DEDICATED

TO

DR. ANNA E. BROOMALL

PROFESSOR OF OBSTETRICS IN THE WOMAN'S MEDICAL
COLLEGE OF PENNSYLVANIA

IN APPRECIATION OF
HER ABLE AND FAITHFUL WORK
AS A TEACHER

PREFACE TO THE SEVENTH EDITION.

In preparing the seventh edition of this work, the previous edition has been carefully revised. A new chapter has been added on "The Examination During Pregnancy" and one on "Obstetric Operations." Other additions to the text will be found under eclampsia, ophthalmia neonatorum, and the care of premature infants. In the chapter on "Care of the New-born Infant," the modified milk formulæ used in the Maternity of the Woman's Hospital have been substituted for certain formulæ of the former edition and the directions for dressing the umbilical cord have been changed to conform with the present usage. In the treatment of breast abscess, Bier's method of suction hyperemia is described.

Several of the old illustrations have been withdrawn and twenty-one new ones have been inserted. The typographical work is entirely new.

CATHARINE MACFARLANE.

132 SOUTH 18TH STREET, PHILADELPHIA,
1911.

PREFACE TO THE SIXTH EDITION.

The methods of procedure advocated in this book are those observed in the Maternity of the Woman's Hospital of Philadelphia. The results attained by an adherence to them have well proved their value. In this, as in former editions, I have made an effort to bring the teachings of the book up to the requirements of modern obstetric practice, and to make the little volume a *vade mecum* of knowledge on the subject; for the guidance, not only of the nurse, but of patients and physician as well.

I have to thank Dr. Anna E. Bromall, Professor of Obstetrics in the Woman's Medical College of Pennsylvania, for her kindly aid in the revision of this edition; and my publishers for their efficient help in the management of business details.

ANNA M. FULLERTON.

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UNITED PROVINCES, INDIA,

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OBSTETRIC NURSING.

CHAPTER I.

THE PELVIS.

The Pelvis is that part of the skeleton found between the lower end of the spinal column and the thigh bones. It consists of four bones—the sacrum, the coccyx, and the right and left innominate or hip bones. These bones form a canal through which the child passes during labor.

A knowledge of the anatomy of the pelvis is necessary to a proper study of midwifery.

The Sacrum is a triangular or wedge-shaped bone, composed of five vertebræ joined firmly together. This bone forms a large part of the posterior wall of the pelvic canal. It is wedged in between the two innominate bones, the base of the wedge being directed upwards, and forming by its union with the spinal column a projection which is known as the *sacro-vertebral angle or promontory*.

The effect of this projection is to decrease the measurement antero-posteriorly of the pelvic brim, making it smaller than any other measurement of the brim. Some of the most serious complications of

labor are caused by this narrowing, hence the promontory is of great importance obstetrically considered. The progress of the child is arrested in its attempt to pass through the pelvic canal at this point when the contraction is too great. Below the promontory the sacrum is curved or hollowed out. This is called the concavity of the sacrum and it provides for the proper rotation of the child's head during labor.

The two innominate bones—*ossa innominata*, or *hip bones*, bound the pelvis in front and on each side. They are very irregular in shape and consist of three parts which in childhood are indicated by the presence of cartilage which joins the various portions together. The upper flaring portions of these bones are called the *ilia*, or *haunch bones*; the lower portions, the *ischia*, or *seat bones*; the *rami* in front, which form the anterior wall of the pelvis and the *pubic arch*, constitute the *pubes* or *share bones*. The pubic bones are united by a joint in front called the *symphysis pubis*. The union of the innominate bones with the base and sides of the sacrum gives us the two joints called the *sacro-iliac articulations*, the largest and strongest articulations in the whole body.

The Coccyx consists of four rudimentary vertebræ which are united to the end of the sacrum by a movable joint, called the *sacro-coccygeal joint*. This joint ceases to be movable late in life, that is from forty-five to fifty years of age. The cartilage in the joint becomes bony and thus the joint becomes fixed. This causes a diffi-

culty in the birth of the child at the outlet of the pelvis, as it narrows the antero-posterior measurement of the outlet.

The **pelvis** is divided by a ridge, called the *ileo-pectineal* line, into two parts, the *true* and the *false* pelvis.

The *false pelvis* is that portion which is above the ileo-pectineal line, and the *true pelvis* is below it. The constricted portion between the two, forming the superior circumference of the pelvic canal, is known as the *inlet* or *superior strait*. The inlet in a normal pelvis is somewhat heart-shaped.

The lower circumference of the pelvis is called the *outlet* and is very irregular in shape.

The *cavity* of the pelvis which lies between the *inlet* and the *outlet* constitutes the pelvic canal. When lined by the muscles and soft tissues which cover its bony walls it is called the *parturient canal*, or *birth canal*.

The cavity is bounded by the sacrum and coccyx, and in front by the symphysis pubis. Its sides are formed by the lower portions of the innominate bones and the soft tissues which fill in the spaces.

The depth of the pelvic cavity and curvature of the sacrum influence the character of the labor. If the cavity is shallow and the sacrum only moderately hollowed out, the labor is likely to be easy and natural; but if the cavity is deep and the curve of the sacrum great, the labor may be tedious and difficult.

In a normal pelvis, the cavity in front measures an inch and a half (the depth of the symphysis pubis); be-

hind it measures 4 $\frac{1}{2}$ or 5 inches (the length of the sacrum and coccyx).

Measurements or Diameters are taken from certain parts of the pelvis to determine the capacity of the pelvic canal. It is important that every pregnant woman should consult a physician in time to have a proper estimate made of the size of her pelvis. The measurements should be taken not later than the seventh month

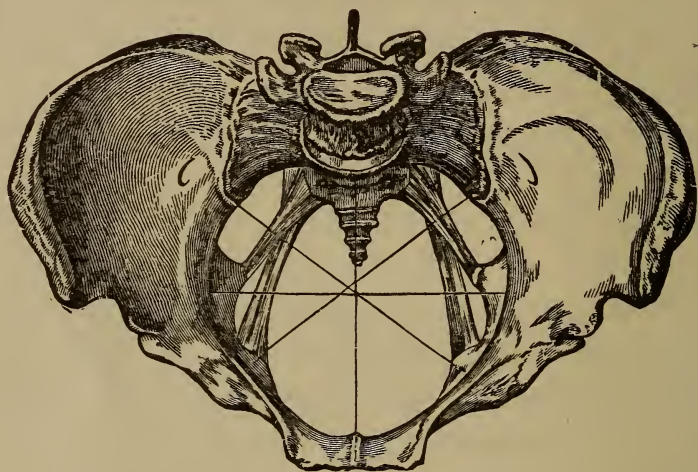


FIG. 1.—FEMALE PELVIS SHOWING THE DIAMETERS OF PELVIC BRIM.

of pregnancy, as it may be desirable for the sake of both mother and child that premature labor should be induced, or at least some decision made as to the proper management of the labor. The most important measurements to be considered are those of the inlet and outlet. The inlet has (1) an *antero-posterior diameter* called also *sacro-pubic* or *true conjugate*. This extends from the upper border of the pubis in front to the middle of

the promontory of the sacrum behind. It should measure normally about $4\frac{1}{2}$ inches; (2) the transverse diameter, which gives us the longest measurement at the inlet, is taken from the middle of the brim on one side to the middle of the brim on the other side. Its average measurement is from 5 to $5\frac{1}{4}$ inches; (3) two oblique diameters. The right oblique diameter extends from the right sacro-iliac articulation to the left ileo-pectineal eminence; the left oblique diameter extends from the left sacro-iliac articulation to the right ileo-pectineal eminence. Each diameter usually measures about 5 inches.

The pelvic canal, or cavity, in the living subject is lined with muscles, bound together and covered by connective tissue. Blood-vessels and nerves are distributed throughout the pelvic cavity, supplying the organs and tissues contained in it.

The pelvic canal forms a curved tube, its planes at different points not being parallel to one another. A *plane* is an imaginary flat surface extending across a tube or canal at any point; and may be represented by placing a sheet of paper across the tube at that point.

The chief planes of the pelvis are: the plane of the brim, or inlet, and the plane of the outlet.

A rod meeting the center of each plane perpendicularly represents the axis or direction of that plane.

The axis of the pelvic canal is formed by uniting the axes of a series of planes which may be imagined to extend across the pelvic canal at various points from the

inlet to the outlet. The curved line which is thus formed represents approximately the direction followed by the child's head in its passage through the pelvic cavity.

The plane of the inlet is much more tilted or inclined than the plane of the outlet. When this inclination is exaggerated, the effect is to make the abdomen very pendulous, thus causing, in pregnancy, the head of the child to be carried so far beyond the pubes as to make it difficult for it to pass through the inlet or to enter it in the normal direction. In this way malpresentations often arise.

The *female pelvis* differs from the *male pelvis* in the following particulars: in the female the bones are lighter, the ilia more expanded, the hips thus being made broader. The inlet and outlet are larger, the cavity larger, the promontory less projecting, the coccyx movable, and the arch of the pubes wider. The relative width of the transverse diameter is much greater in the female pelvis.

Deformities and Contractions of the Pelvis.—The diseases which most commonly cause deformities or contractions of the pelvis are *rickets*, or *rachitis*, and *osteomalacia*. Diseases of the spine, such as may be caused by *tuberculous* bone abscesses, may cause the vertebræ or spine bones to become distorted or dislocated and thus affect the shape and capacity of the pelvis.

Rickets, or *rachitis*, is the most common cause of pelvic abnormalities. It is a disease of childhood and is apt

not only to distort the pelvis, but to arrest its growth so that a rickety pelvis is generally undersized. It is usually also flattened, the symphysis pubis being pressed back towards the sacrum and the promontory of the sacrum bulging forward into the cavity of the pelvis. The effect of this is to shorten the antero-posterior diameter and to cause a relative lengthening of the

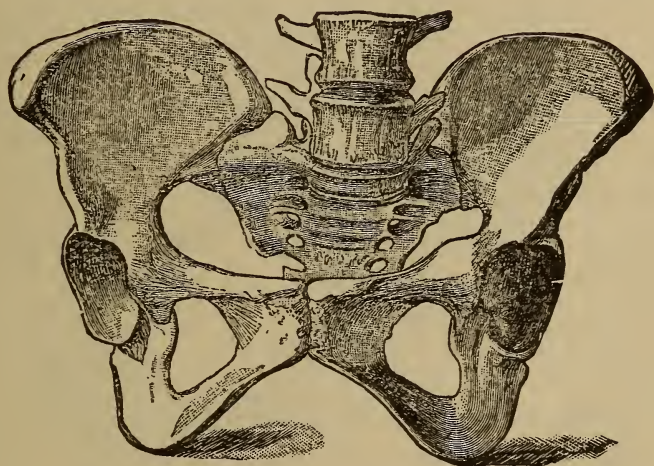


FIG. 2.—RACHITIC FLAT PELVIS WITH ASYMMETRY AND DOUBLE PROMONTORY.
(Winckel.)

transverse diameter of the inlet. The cavity of the pelvis and the outlet may not be diminished, but, on the other hand, expanded in a rickety pelvis. The *labor* in such a pelvis is apt to be affected, as follows: If the conjugate diameter is only slightly decreased, the presenting part will remain longer than ordinary above the brim, and because the head does not fill the brim as it should do, the cord may slip down in front

of it or to one side. The *os uteri* for the same reason dilates more slowly. Thus the *first stage of labor is prolonged*. After the presenting part is sufficiently moulded to clear the inlet, the labor progresses normally.

Sometimes the contraction at the brim is so marked that the head may not enter at all and it becomes necessary to deliver by some operation, as version, delivery by forceps, symphysiotomy, craniotomy, etc.

The *osteomalacic* pelvis is a deformity caused by the softening of the bones in adult life. This leads them to yield under pressure and causes great distortion of the shape of the pelvis. The pubes assume a peculiar beak-like form, and the pelvic canal is very greatly narrowed. The disease which causes such deformity occurs most frequently in countries where the people are underfed. In most cases *delivery* can only be accomplished by means of Cæsarean section. The *kyphotic* pelvis is one form of contracted pelvis caused by the pulling backward of the base of the sacrum. This may result from the form of spinal curvature which is commonly known as "humpback." The result is that the diameters of the inlet are reversed, the conjugate or antero-posterior being the longest, and the transverse being the shortest. This causes an *irregularity in the way in which the head of the child enters the inlet*, causing the long axis of the child's head to enter the conjugate diameter instead of an oblique diameter.

In the *funnel-shaped* pelvis the outlet is contracted, the tuberosities of the ischia being brought nearer to

each other and the lower end of the sacrum being pushed forward. The pubic arch is diminished, an angle being produced. All these conditions tend to *delay* the expulsion of the presenting part *at the outlet*.

The *oblique* pelvis may be the result of lateral curvature of the spine, or of disease either in the hip-joint or

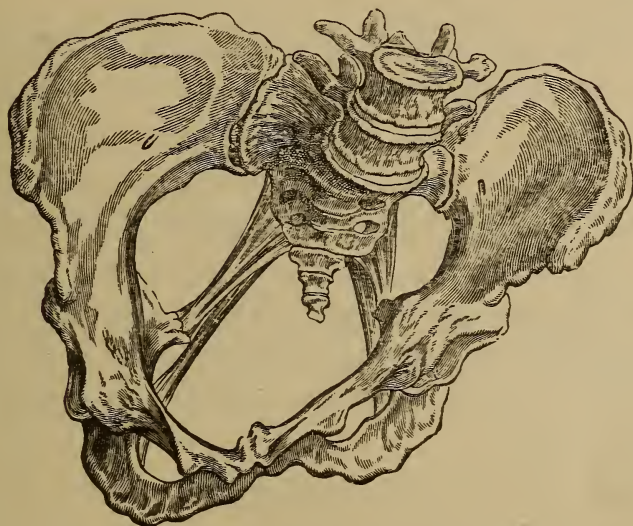


FIG. 3.—OBLIQUE PELVIS OF NAEGELE.

sacro-iliac articulation. Lameness occurring in childhood from any cause may also produce it. The pelvis is distorted to one side and thus receives its name. *Irregularities in the mechanism of labor* are caused by this deformity and, according to the degree of distortion, any of the obstetric operations may be called for, as version, forceps-delivery, craniotomy, etc.

The *spondylolisthetic* pelvis results from disease in the lumbar vertebræ, at the small of the back. The bones

becoming softened, slip forward into the pelvis and this shortens the antero-posterior diameter. This deformity is very rare.

A *cleft* pelvis is one in which the rami of the pubic bones fail to come closely together, the articulation being imperfect. This also is very rare and is apt to be accompanied by ectropion of the bladder.

The pelvis *æquabilites justo minor* is smaller in all its measurements than a normal pelvis. The *labor* in this case is apt to be *tardy* because of the contraction.

The pelvis *æquabilites justo major*, or giant pelvis, is one which is larger in all its diameters than a normal pelvis. This is apt to cause a *rapid or precipitate labor*.

Bony tumors and excrescences, and fractures and other injuries to the bones of the pelvis may also diminish the size of the pelvic canal and affect the character of the labor.

Sufficient has perhaps been said to show the necessity for the thorough examination of the pelvis in any case of expected labor.

The *muscles* and other soft tissues lining the pelvic canal form a soft covering for the bones and to some extent slightly decrease some of the diameters of the pelvis. As they are not otherwise of obstetrical importance, the student is referred for their study in detail to works on anatomy.

The same may be said of the *blood-vessels* and *nerves* supplying these structures.

CHAPTER II.

THE PELVIC ORGANS.

The Internal organs of generation are the uterus, Fallopian tubes, and ovaries. These are contained within the true pelvis. The bladder and the rectum are also found in the true pelvis.

The External Organs are called the “*pudenda*,” or “*vulva*.”

Immediately above the pubic bone, or anterior border of the pelvis, is a cushion of fat, usually covered with hair. This is called the “*mons veneris*.” On each side of the opening of the vulva are the “*labia majora*,” or large lips. Lying beneath these and concealed by them, in young women, are two thin folds of flesh, named the “*labia minora*,” or “*nymphæ*.” They join together above, and at their junction is a small projecting body called the “*clitoris*.” The small triangular space between the clitoris and the nymphæ is the “*vestibule*.”

The opening of the urethra (the “*meatus urinarius*”), through which the urine escapes from the bladder, is in the middle of the lower border of the vestibule. It is very important that the nurse should know the exact position of the *meatus urinarius*, as she will frequently be called upon to pass the catheter.

Below the vestibule is the orifice of the "vagina," the canal leading to the uterus, or womb. In virgins a delicate membrane, usually crescentic in shape, blocks the entrance to the vagina. This is the "hymen."

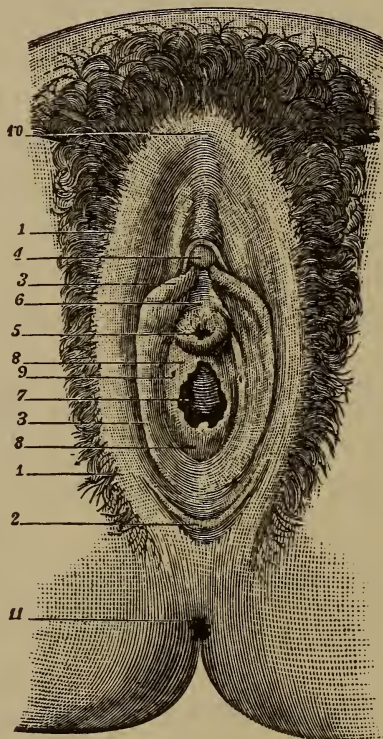


FIG. 4.—EXTERNAL GENITALIA.

1. The right labium majorum. 2. The fourchette. 3. Right nymph. 4. Clitoris. 5. Urethral orifice. 6. Vestibule. 7. Orifice of vagina. 8, 8. Hymen. 9. Orifice of duct of vulvo-vaginal gland. 10. Mons veneris. 11. Anal orifice.

The hymen is usually ruptured at marriage, but a woman may be a virgin yet have no hymen; in some cases it persists even after marriage, and offers an obstruction at childbirth. A woman who has borne chil-

dren has a few fleshy projections at the orifice of the vagina, the only remains of the hymen, called the "carunculæ myrtiformes." Between the vulva and the anus is a mass of flesh, the space on the surface measuring one and one-half inches in length. During the birth of the child this becomes greatly distended, and thins like rubber. This is the "perineum." It may be torn during labor to a greater or less extent; sometimes it is completely torn into the bowel. That part of the perineum in the virgin which forms the posterior border of the vulva is called the "fourchette." It is merely a fold of skin, and is almost always torn in a first labor. Behind the perineum is the "anus," or orifice of the rectum, the lower part of the bowel.

The Vagina is a canal connecting the external with the internal organs of generation. The uterus is at the top of the vagina. In front of the uterus is the bladder, and behind and to the left the rectum.

A secretion of mucus keeps the vagina moist. There should, however, be no discharge in a perfectly healthy woman. During pregnancy, and as a result of ill health or local inflammation, the natural secretion may be greatly increased, and the patient is then said to have "the whites." In labor the discharge is very greatly increased, so as to aid the birth of the child.

The Uterus is a pear-shaped organ, three inches in length, one and one-half inches in breadth, and about one inch in thickness. It weighs a little over an ounce in its normal condition in a virgin. After child-bearing

it remains larger and heavier than before. That portion of the uterus which communicates with the vagina is called the “neck, or cervix.” The chief portion of the organ above this is called the body, and the rounded upper surface the fundus. The opening in the cervix which communicates with the vagina is called the “os uteri.” That portion of the cervix in front of the os uteri is the anterior lip, while that part which lies behind is the posterior lip.

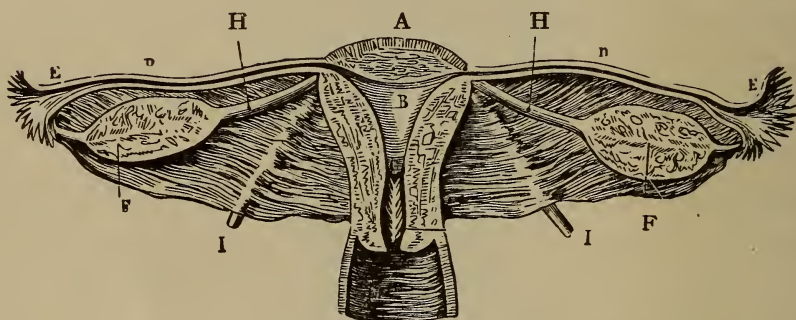


FIG. 5.—CAVITY OF THE UTERUS AND FALLOPIAN TUBES.

A. Superior border or fundus of the womb. B. Cavity of the womb. C. Cavity of the neck of the womb. D, D. Canal of the Fallopian tube. E, E. The fimbriated extremities. F, F. The ovaries. G. The cavity of the vagina. H, H. The ovarian ligaments. I, I. The round ligaments.

The Fallopian Tubes are two canals which pass from each side of the upper portion of the uterus. They are from three to four and one-half inches long, and will admit the passage of a bristle. Each ends in a trumpet-shaped opening surrounded by a fringe of small projections called “fimbriæ.” This is called the fimbriated extremity. When the ovum (or egg) escapes from the

ovary, it is received by the Fallopian tube and reaches the cavity of the uterus in this way.

The Ovaries are two small flattened bodies about an inch long and half an inch thick containing many thousand germ cells or ovules. They lie about an inch from the fundus of the uterus on each side, in the folds of the broad ligament. The broad ligaments are folds of peritoneum, a thin glistening membrane which covers the uterus and all the pelvic organs, and by means of which the uterus is suspended in the pelvis. The bladder and rectum being covered with the same tissue, there is an intimate connection between the three, so that if one is deranged the others are also likely to be involved.

The Breasts are considered as belonging to the external organs of generation. They are two glands situated on the front of the chest, one on each side of the breast-bone. They vary in size and shape in different women, and during pregnancy they enlarge greatly. They secrete milk for the nourishment of the child. The nipple at the apex of the gland is a conical-shaped projection. The milk ducts all come toward it from the different parts of the breast and open on its surface. The areola is a pink or brown circle which surrounds the nipple.

There is an intimate connection between the breasts and the uterus. Pain in the breast may be the result of disease of the uterus. The secretion of milk is called "lactation."

Menstruation is a bloody discharge from the uterus every month. It begins usually about the age of fourteen and recurs every month, except during pregnancy or while a woman is nursing. There are occasional exceptions to this rule. It ceases at the change of life, or menopause (usually between forty-five and fifty).



FIG. 6.—SHOWING ENLARGED MILK DUCTS DURING LACTATION. (*Morris.*)

At puberty—that is, when this function first appears—the girl becomes a woman, the breasts enlarge, and the pelvis increases in size. The organs of generation become ready to perform the functions of reproduction. The menstrual flow recurs every twenty-eight days and

lasts about four days. The quantity of blood lost at a period is from four to eight ounces. Different women vary much in this respect. The discharge is blood mixed with mucus. Its color is dark red. Any peculiarity in color, or the appearance of any clots in the discharge, will need to be noticed by the nurse and the discharge kept for the doctor's inspection. There is usually a feeling of discomfort at the menstrual period, with headache, pains in the back, breasts, etc. These symptoms are more severe in some women than in others. The periodic congestion of the uterus, which results in the production of the menstrual flow, is probably associated with the ripening of the ova or eggs in the ovaries called ovulation. It has been found, however, that the ova may escape from the ovaries and be carried into the uterus through the Fallopian tubes independently of menstruation. The ova that do not become impregnated are simply carried away by the natural discharge.

Conception most usually takes place immediately or very soon after a period. This is not an invariable rule, as women have become pregnant before menstruation has been established, or even after the menopause. They may also become pregnant while nursing. The principal disorders of menstruation are:

Dysmenorrhea, or painful menstruation;

Menorrhagia, or excessive flow at the period;

Amenorrhea, or suppression of the menstrual flow;
and

Metrorrhagia, the occurrence of hemorrhage between the menstrual periods.

The causes of these disorders are very numerous and must be determined by a physician.

CHAPTER III.

THE DEVELOPMENT OF THE OVUM.

Ovulation is the process whereby ovules mature in the ovary and are projected from its surface into the Fallopian tubes where impregnation usually takes place. When an *ovule becomes impregnated* the mucous lining

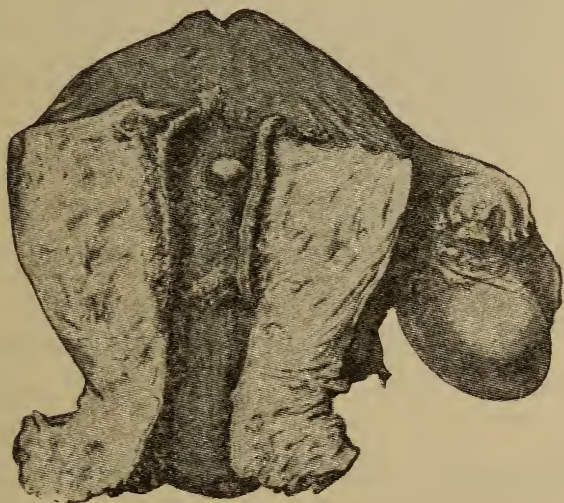


FIG. 7.—UTERUS AND OVUM AT SEVENTH OR EIGHTH DAY, SHOWING DECIDUA VERA. (Edgar.)

of the uterus becomes thickened and vascular. The fertilized *ovule* is called an *ovum*. On reaching the uterus it becomes imbedded in the thickened mucous membrane which grows around it and forms a covering

known as the *decidua reflexa*. The remainder of the mucous lining of the uterus, with the exception of that which lies beneath the attached ovum, is called the *decidua vera*.

The portion to which the ovum is attached is the *decidua serotina*. The latter with blood-vessels and nerves supplied from the walls of the uterus develops into the *placenta*, or after-birth. After the third month of pregnancy the *decidua vera* and the *decidua reflexa* come in contact with each other and unite to form one membrane, shreds of which are often seen, after a birth, clinging to the outer surface of the *chorion*, or outer layer of the bag of membrane enclosing the foetus.

The *chorion* in the early stage of its development is covered with tufts called *villi*. Later on many of these villi shrink and disappear. Those, however, which are next the *decidua serotina* greatly increase in size and number and are penetrated by blood-vessels, running from the foetus, thus forming the *fœtal portion* of the placenta.

The *amnion* is the internal layer of the sac which contains the foetus. It contains within it the amniotic liquid in which the child floats during the time it is carried in the uterus.

The *amniotic liquid*, or *liquor amnii*, consists of water holding in solution a small quantity of albumen and some salts. It is supposed to be secreted by the amnion. The amniotic liquid protects the foetus during its life

within the uterus from shock and jolting, as well as from the contractions of the uterus during labor. In labor it helps to dilate the uterine os, for being contained in the amnion, a *pouch* is formed which presses down into the mouth of the womb, causing it gradually to open.



FIG. 8.—OVUM CUT OPEN SHOWING EMBRYO, AMNION AND CHORION. (*Edgar.*)

The chorion and amnion lie in very close contact with each other by the end of gestation. The amnion, a very thin, shining membrane, may be peeled off the shaggy chorion. It lies also over the foetal surface of the placenta and forms a covering for the umbilical cord.

For the purposes of description the *placenta* is divided into a *maternal* and *foetal* portion, but there is no marked line of division between them.

The blood-vessels, both arteries and veins, in the part of the uterus immediately connected with the placenta become enlarged. The veins are developed into large channels or *sinuses*. The arteries running between the



FIG. 9.—PLACENTA AND UNRUPTURED MEMBRANES AT THE THIRTY-EIGHTH WEEK. (*Edgar.*)

uterus and placenta become corkscrew-like as they develop and are called *curling arteries*. The arteries which come from the foetus through the umbilical cord divide and subdivide, so that finally a capillary or hair-

like vessel runs into a villus. At the extremity of each villus the vessel turns back and becomes a vein. The little veins from the villi are afterwards gathered together into large trunks which unite into the large *vein of the umbilical cord*.

The circulation of the blood in the foetus is entirely separate and distinct from that in the blood-vessels of the mother. In the placenta the blood-vessels of the foetus, in the chorial villi, lie in close contact with the large blood-vessels of the mother. In this way an interchange of gases takes place between the maternal and the foetal blood. Oxygen and other supplies are given to the foetal blood-vessels, and the blood is thus purified and replenished. Carbon dioxide and other impurities are carried off through the maternal circulation.

The placenta has two surfaces, the *fœtal* and the *maternal*. The internal or foetal surface is smooth, being covered by amnion through which the branches of the two umbilical arteries and one umbilical vein are seen branching out and dividing before they enter the substance of the placenta.

The umbilical cord is usually attached to the placenta near the middle of the foetal surface; but sometimes it is attached to the edge, when it is called a *battledore placenta*. Very occasionally the cord is attached to the membranes, when it is called *placenta vellamentosa*.

The placenta is usually about eighteen inches in circumference and one or two inches thick.

In *twin births* each child has usually its *own placenta* and *bag of membranes*. Sometimes the placentæ are attached to the uterine wall at quite separate points. Again they are close together and seem fused into one. More rarely there is only one placenta for both children with a single bag of membranes. When twins are found in one amniotic sac they are generally of one sex.

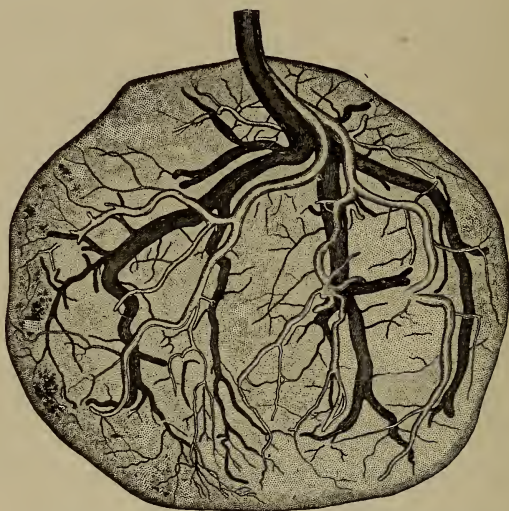


FIG. 10.—FŒTAL SURFACE OF PLACENTA AT TERM. (*Minot.*)

The *umbilical cord*, *funis*, or navel string is the means of communication between the placenta and the foetus.

The cord varies in length at full term. It may be only one foot. Usually it is about two feet. In some cases it may be considerably longer.

Two *umbilical arteries* and one *umbilical vein* are found in the cord. These are surrounded by a gelatinous matter, called *Wharton's jelly*, which supports the blood-

vessels. The arteries are twisted around the vein. During labor if the cord becomes prolapsed it may be seized between the fingers and the *fœtal pulse*—the beating of the arteries in the cord—may be felt. Sometimes *knots* are found in the cord, which are formed by the child passing through a loop in the cord while it still floats in the amniotic liquid. These are called *true knots*, to distinguish them from *false knots*, which are simply thickened places in the cord caused by accumulations of Wharton's jelly. Sometimes true knots in the cord are drawn so tight that the fœtus is killed either before or during the delivery by the obstruction of its circulation. The term *fœtus* is applied to the product of conception at the end of the third month of pregnancy. During the first three months it is called an *embryo*.



FIG. II.—HUMAN EMBRYO AT END OF SECOND MONTH. (Edgar.)

It is desirable that a nurse should understand a few facts as to the *development of the embryo and fœtus* during the different months of pregnancy. In the second month the head and extremities are visible and the embryo weighs about 60 grains. In the third month the head is out of proportion in size to the rest of the body and the embryo weighs about 200 grains. Sex may be distinguished in the fourth month. The fœtus measures about 6 inches and weighs from 4 to 6 ounces. At the fifth month the measurement is about 10 inches and the

weight 10 ounces. The nails are beginning to form. At the sixth month the foetus is about 12 inches in length and weighs one pound. The eyelashes are formed. In the male child the testicles are still in the abdomen. By the seventh month the length is about 14 inches and the weight three or four pounds. The eyelids are open and the testicles have descended into the scrotum. The skin is wrinkled and very red, and there is considerable woolly hair, called *lanugo*, over the body. During the eighth month the foetus measures about 19 inches and weighs from four to five pounds. At the end of the ninth month it usually weighs from six and a half to 7 pounds, and measures about 20 inches. In some cases the child may weigh from eight to ten pounds. It is covered at birth with a greasy, whitish material called *vernix caseosa*.

CHAPTER IV.

SIGNS OF PREGNANCY.

The Signs of Pregnancy may be divided into three classes: the suspicious, the probable, and the certain.

Under the head of *suspicious* signs may be classed the many nervous sensations which are apt to accompany early pregnancy; as, general discomfort, sudden changes of temperature, headache, toothache, giddiness, faintness, changes in disposition, perverted appetite, etc.

Of the *probable* signs one of the earliest and most constant is the *stoppage of the monthly flow* in a person who has been regular. This may be, however, caused by other conditions than pregnancy. Thus, change in one's mode of living, a new climate, or general ill health may produce the same result. In the early months of marriage we may also have an irregularity in menstruation where there is no pregnancy. On the other hand, in rare instances, we may have the monthly flow persisting for some months or throughout the entire pregnancy. It is then generally scanty and short in duration.

A *deepening in the color of the vagina and vulva*, by which they take on a purplish hue, is another sign, and is caused by the enlargement of the blood-vessels and a stoppage of the circulation, due to pressure from the

enlargement of the uterus. This coloration may be caused to some extent by tumors.

Increase in the size of the breasts occurs in the early months of pregnancy with a deposit of coloring matter in the areola, or ring which surrounds the nipple. Some of this coloring matter seems to extend irregularly over the outer margin of the ring, and is called the "secondary areola" or "areola of Montgomery." With this distention of the breasts there is also a secretion found in them—a watery fluid, sometimes yellowish in color, known as "colostrum," which appears about the third month.

Temporary distention of the breasts, with the accumulation of this secretion, may occur in a slighter degree as an accompaniment of menstruation, or it may persist for a long time after a woman has stopped nursing her infant.

Enlargement of the abdomen, which begins about the end of the third month of pregnancy, is another important sign. Yet this may also be caused by tumors, or by flatulence, or by the deposit of fat in the abdominal walls.

Marks upon the abdomen, due to the rapid stretching of the skin, sometimes occur in great numbers, and are called "*striae*," owing to the fact of their resemblance to the marks left by whip-lashes. These marks sometimes extend down upon the thighs. This, too, may be caused by tumors. The "brown line" of pregnancy is the deposit of pigment in the median line of the abdomen.


This may exist when there is no pregnancy, as also may the peculiar browning of the skin found in irregular



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patches over the face, particularly on the forehead, and called the "mask of pregnancy."

"*Morning Sickness*," another sign, begins early in the second month or at the time of the first missed



lower portion of the posterior wall of the uterus, and the increase of the antero-posterior diameter of that organ, as discovered by what is known as bi-manual palpa-

tion—one finger of the examiner resting over the posterior wall of the uterus through the rectum, while the other hand makes pressure over the lower part of the abdomen.

Another sign is that afforded by the thermometer, when its bulb is carried within the cervical canal. If pregnancy exist, the *temperature* is said to be from a half to one degree higher than in the vagina.

The *pulse* of a pregnant woman is said also to show less variation from change in position than that which occurs in the non-pregnant state. Thus, the change from lying to sitting or standing does not cause a quickening, such as is usually observed in the non-pregnant state.

The *uterine souffle* is a blowing sound which is supposed to occur in consequence of the enlargement of the blood-vessels of the uterus, and which, therefore, corresponds in its rhythm with the radial pulse of the patient. This must not be confounded with the *funic souffle*, a blowing sound which sometimes occurs in the vessels of the cord, and which is synchronous with the foetal pulse, therefore about twice as rapid as the mother's pulse.

When the uterus is large enough to be felt through the abdominal walls, palpation over it is apt to cause a *contraction*, which is indicated by a temporary hardening. This is another indication of pregnancy.

The *positive* signs of pregnancy as agreed upon by most obstetricians are but two: the direct appreciation

of the parts of the child by touch, and the "foetal pulse," or heart sounds of the child. The "foetal pulse" is, as a rule, twice as fast as the pulse of the mother. It is hardly strong enough to be heard, even by experienced ears, much before the fifth month—or end of the twentieth week; rarely heard well before the twenty-fourth week.

Methods of Determining Date of Confinement.—

The ordinary method of reckoning the probable date of confinement is as follows: Learn on what day the last monthly flow began, then count three months backward (or nine months forward) and add seven days. For example, say that a woman was unwell last on March 15: counting three months back gives December 15; add seven days, and we have December 22 as the probable date of her confinement. All methods of reckoning are only approximate. It is best to consider the date calculated as the middle of a period of two weeks, within which labor may occur at any time. When, for any reason, it is impossible to make the calculation by this method, it may be computed by adding four and a half months to the date of quickening in the case of a woman pregnant for the first time, and five months in the case of one who has previously borne children.

The third method, that of adding forty weeks, or ten lunar months, to the date of conception, is too uncertain to be of much practical use. Examination of the patient by an intelligent physician who knows and appreciates the distinctive signs of the several months

offers a fourth method of computing the date of pregnancy.

Some of the more important of these distinctive signs may be mentioned, as determined both by *external* and

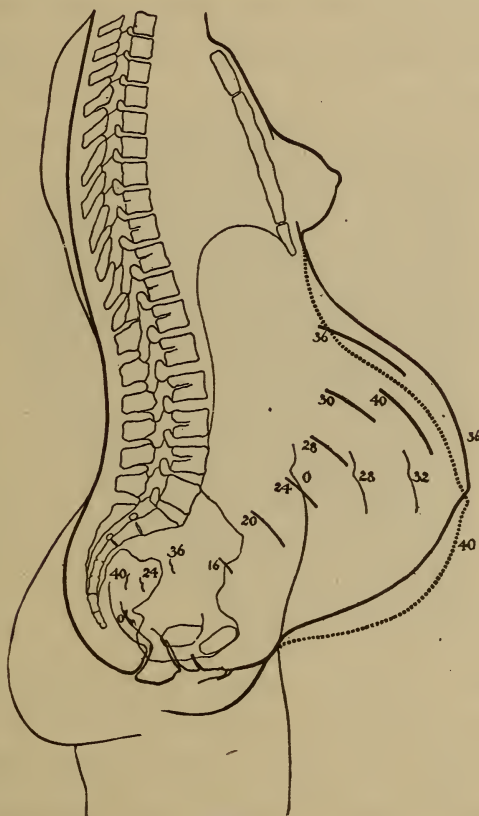


FIG. 13.—HEIGHT OF THE FUNDUS AND POSITION OF THE CERVIX IN THE SEVERAL WEEKS OF GESTATION. (Edgar.)

internal examination. During the first month of pregnancy the uterus, because of its weight, sinks lower than before, so that the abdomen is flattened, the navel being depressed. It is not until the end of the fourth

lunar month that the uterus rises above the brim of the pelvis. About the middle of the fifth month the fundus of the uterus may be felt about midway between the umbilicus and the pubes. By the end of the sixth month it reaches to the height of the umbilicus. By the end of the seventh month it is three fingers' breadth above the umbilicus. By the ninth month it has reached almost to the lower end of the breast-bone, and during the tenth lunar month it sinks to a point about midway between the umbilicus and lower end of the breast bone. This is caused by the head of the child pressing down into the pelvic canal, thus the abdomen is made to look smaller than it did just before the descent. By making an internal examination,—that is, carrying a finger up into the vagina, the head of the child may be felt through the tissues of the neck of the uterus and will be found to lie quite low. In the earlier months before the presenting part has engaged, it will be difficult to reach by the examining finger and the neck of the uterus will not be found to be obliterated.

During the latter part of the last month of pregnancy, there is a gradual stretching of the lower segment of the uterus, the cavity of the body of the uterus and the cervical canal are made to communicate by the widening of the internal os uteri, until finally the two are made to form but one cavity and the external uterine os is felt as a small opening lying directly in contact with the presenting part.

The *settling* of the child, causing the descent of the

uterus, produces a relaxation of the abdominal walls and a pouting of the umbilicus during the last month of pregnancy.

During the last weeks of pregnancy the *position* of the foetus in the uterus may be determined by palpation over the abdomen. The patient should lie on her back

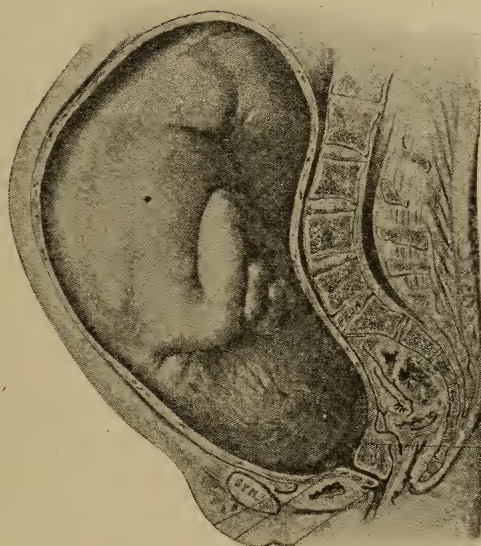


FIG. 14.—FROZEN SECTION OF UTERUS FROM A PRIMIPARA AT THE FORTIETH WEEK. (*Edgar.*)

with her lower limbs drawn up and the abdomen uncovered. The body of the child may then be felt by passing the hands over the abdomen, and the position in which it lies thus determined.

In *multiple pregnancy* more than one child exists. Twin pregnancy occurs once in about 90 cases. Triplets are very rare,—occurring once in about 8,000 labors. . Larger numbers at one birth are still less fre-

quent. In multiple pregnancies the shape of the abdomen differs from that seen in single pregnancies. The abdomen is broader across and more irregular in shape. Sometimes in twins pregnancy, if the abdominal walls are thin, a furrow or depression may be seen between the two foetuses. On palpation, also, two separate foetal heads and foetal trunks may be made out. On auscultation two distinct foetal hearts may be made out.

Extra-uterine or ectopic pregnancy occurs outside the uterus. When it takes place in the peritoneal cavity it is called *abdominal* pregnancy; when in the ovary, it is known as *ovarian* pregnancy; when in the Fallopian tubes, it is called *tubal* pregnancy. *Tubal* pregnancy is the most common of these forms. The gestation sac usually bursts about the third or fourth month, and the patient may lose her life unless she receives the prompt attention of a good surgeon. All extra-uterine pregnancies are abnormal conditions and when suspected should receive prompt medical attention. The signs of early pregnancy exist but the uterus fails to enlarge regularly, and severe cramp-like pains with blood discharges are apt to recur at intervals.

Numerous tables for a rapid computation of the date of confinement have been made. The accompanying table is one much used. By taking the upper figure in each pair of horizontal lines as representing the date of the first day of the last menstrual period, the figure immediately beneath it will represent the probable date of confinement.

TABLE FOR CALCULATING THE PROBABLE DATE OF LABOR.

Jan.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Nov.
Oct.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	
Feb.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Dec.
Nov.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	
March.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jan.
Dec.....	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	
April.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	..	Feb.
Jan.....	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	..	
May.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	March.
Feb.....	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	
June.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	..	April.
March.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	..	
July.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	May.
April.....	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	
Aug.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	June.
May.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	
Sept.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	..	July.
June.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	..	
Oct.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aug.
July.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	
Nov.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	..	Sept.
Aug.....	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	..	
Dec.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Oct.
Sept.....	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	

EXPLANATION.—Find in top line the date of menstruation, the figure below will indicate the date when confinement may be expected; *i. e.*, if date of menstruation is June 1st, confinement may be expected on March 8th, or one day earlier if leap year.

CHAPTER V.

MANAGEMENT OF PREGNANCY.

The management of pregnancy consists, for the most part, in greater attention to the laws of health. The increased activity of all the organs of the body, together with the disturbances caused by pressure, necessitates this.

Constipation is an almost invariable accompaniment of pregnancy. In the early months it is a sympathetic condition; later, the effect of direct pressure upon the bowels. It is also, undoubtedly, in part due to the want of exercise.

The treatment of constipation is the same as in other conditions, except that only mild laxatives are used. Regularity in attention to the bowels, a glass of hot water at night and again in the morning, liquids (either milk or water), not taken with the meals, but in the intervals, a teaspoonful of common salt in the water occasionally, the use of uncooked fruit and coarse bread, the avoidance of starches and fine flour—all these are helpful in overcoming this condition. There is an objection to the use of sugared fruits, as confection of fruit, senna leaves, etc., because of their liability to disturb the stomach. Prunes are, perhaps, the least objectionable; licorice powder, because of the senna which it

contains, is apt to cause griping pains. Rhubarb is, perhaps, the best of the mild laxatives. A small piece of rhubarb root, the size of a pea, may be taken at night, followed by a glass of water. If there is an objection to its taste, it may be taken in pill form. Fluid extract of cascara sagrada with an equal amount of glycerine is useful.

Cream of tartar, a half teaspoonful being taken at night in a cup of cold water, is often efficient. In some cases it may be necessary to repeat the dose in the morning.

Massage of the abdomen, so efficient in the management of constipation, should never be resorted to in the pregnant state, as it is apt to excite uterine contractions and may lead to miscarriage. There is an objection to the too frequent use of enemata on the same ground; also, the habit is thus acquired of depending upon this stimulus, and overdistention of the bowel is the result. It may be necessary, however, occasionally to alternate an enema with a laxative, especially when the patient suffers from piles.

Diarrhea is rather a rare disturbance of pregnancy, but it sometimes occurs as a direct result of constipation—small, hardened masses forming in the bowel, known as “scybala,” which produce an irritation of the mucous lining. The use of rhubarb night and morning, in the manner described above, until all the masses are removed from the bowels, will serve to check the diarrhea. Should the condition be due to other causes,

as indigestion, etc., appropriate remedies will have to be prescribed by a physician.

Changes in the Urinary Organs are mainly due to direct pressure. In the first three months of pregnancy there is direct pressure on the bladder, hence great irritation, due to interference with the distention of the bladder, producing a *constant desire* to pass water. For this the recumbent position is the only help. The uterus rises in the abdomen at the end of the third month, and the bladder being thus relieved from pressure, this symptom passes away.

The tendency from the fourth to the ninth month is to the *accumulation of urine*, because there is less than the proper irritability of the bladder, the organ being flattened between the uterus and the abdominal walls, and its walls thereby suffering a partial paralysis.

In the last month there is *incontinence of urine*, because the pressure is so great that there is no room for the accumulation of urine.

During labor there is pressure upon the neck of the bladder and urethra, leading to *retention*. This may exist for the last two weeks of pregnancy. Necessity for the use of the catheter is confined, as a rule, to this period. The distention of the bladder may impede labor. With the drawing up of the uterus the bladder is drawn up and the urethra elongated, hence a long catheter will be necessary. Some use the English rubber catheter, Nos. 8 and 9. The glass catheter carefully used is best.

Sometimes irritability of the bladder is due to *excessive acidity* of the urine. A physician will generally prescribe some alkali to overcome this condition, as a drop of liquor potassa in a tablespoonful of milk once in three or four hours, or the use of mucilaginous drinks, as flax-seed tea, barley water, milk, etc., may relieve the distress.

When the abdominal walls are much stretched and the uterus falls upon the bladder, this may be remedied by the use of the binder or an abdominal supporter.

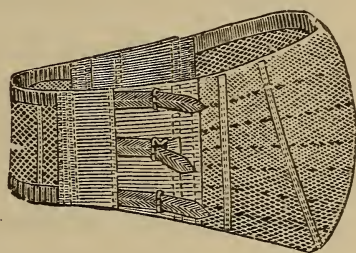


FIG. 15.—ABDOMINAL BELT.

Incontinence of Urine leads to the *excoriation* and reddening of the parts about the vulva. Frequent washing with warm water and borax or pure Castile soap relieves the irritation. Diachylon or zinc ointment is best when an ointment is needed.

Incontinence is sometimes the result of overdistention of the bladder. Here the use of the catheter is indicated.

A nurse, unless thoroughly experienced, should never attempt to pass the catheter in the case of a pregnant woman, as serious injury may be done to the soft parts in a bungling attempt. In all cases she should have the sanction of the physician before doing so.

The Kidneys are especially subjected to pressure from the seventh to the ninth month of pregnancy. A passive congestion is thus produced, which may lead to

the occurrence of albuminuria, or albumin in the urine. This is an evidence of a drain upon the blood which the physician needs to watch very carefully. It is customary, therefore, for physicians to examine the urine of patients whom they expect to attend at least once a week, from the seventh month on to the termination of pregnancy. Scanty urine, headache and impairment of vision may be symptoms of grave kidney disease and should be reported to the physician promptly.

Examination of Urine.—The urine obtained on first emptying the bladder in the morning before breakfast, if possible, is the most satisfactory for examination. When a small quantity of albumin is present in urine, it is often increased after a meal. The same is true of sugar. A specimen obtained by the use of the catheter is the best for the purpose, if the patient be troubled by a discharge from the vagina.

It is important also to note the amount of urine passed daily during pregnancy. The nurse in attendance upon a patient who is awaiting her delivery should make a *daily record* of the *amount* passed, to keep the physician informed as to the work done by the kidneys.

The average quantity of urine excreted in twenty-four hours in health during the non-pregnant state is about three pints, or fifty ounces. A clean vessel, set aside for the patient's exclusive use, should be used by her each time that the bladder needs to be emptied during the entire twenty-four hours. The nurse then measures

the amount, using for the purpose a graduate set aside for the work, or some other vessel of known capacity.

The *color* of the urine will need to be noted by the nurse, in her record. The natural color is clear, pale yellow, or amber. Substances taken by the patient, as food or medicine, or conditions of disease may cause the color to vary, or render the urine turbid.

There is a natural increase in the amount of urine passed by a pregnant woman, but the increase is mainly in the water. Therefore the urine will be lighter colored than usual.

The *reaction* of the urine should be acid. Small strips of blue and pink litmus-paper (that is, paper colored by a delicate coloring matter known as litmus) should be kept on hand for the purpose of testing the urine while fresh. When a strip of the blue litmus-paper dipped into the urine turns pink, we know the urine is acid; when the pink paper is made to turn blue, the urine is alkaline; when no impression is made on either, it is neutral.

Usually the estimate of the *amount* passed in twenty-four hours, and a record of the *color* and *reaction* cover the requirements of a nurse's observations of the urine. Sometimes, however, a physician requires the nurse to test daily for the *presence of albumin*. This test is effected as follows: Fill a test-tube one-quarter or one-third full of clear urine (after filtering the urine, if cloudy, through filter paper). If the urine is not distinctly acid in reaction, add a few drops

of acetic acid. Boil the fluid over an alcohol lamp, directing the flame to the upper part of the urine. If a cloudiness appears, it is thus at once contrasted with the clear urine of the lower layer, as the tube is held up toward the light. This cloudiness may be due to albumin or earthy phosphates. A few drops of nitric acid, if added, will make the phosphates disappear but not the albumin.

Leucorrhea, a discharge from the vagina, commonly known as "the whites," is often considerably increased during pregnancy, and is due to the greater activity in the secretion of all the mucous membranes. If a vaginal discharge be of white, yellow, or green color, it indicates inflammation of the vagina itself. The discharge, on reaching the vulva and coming in contact with the air, decomposes and becomes irritating. Cleanliness is important in overcoming the effects of this. The itching induced by it is sometimes very obstinate, and generally worse at night. A solution of borax and water for bathing the parts, or carbolic acid, 15 to 20 m to a pint of water, will often give relief. Should vaginal injections be ordered by the physician, they should be given with great caution. A fountain syringe should be used, which produces a continuous stream, and the rubber bag or reservoir containing the water should not be held higher than two feet above the level of the bed or couch on which the patient lies. The interrupted stream should never be employed. In some conditions of excessive discharge the physician may prescribe tannic

acid suppositories to be used nightly in the vagina. After a thorough drying of the parts surrounding the vulva, they may be dusted with a powder consisting of one part powdered camphor to four parts starch. This often gives great relief. Calomel powder may be used in the same way.

Hemorrhoids, or Piles, are often very troublesome during the latter part of pregnancy. Lying down immediately after a movement of the bowels, and remaining in the recumbent position for ten to fifteen minutes, will tend to relieve them, also care in obtaining a daily evacuation of the bowels, and the use of means to secure as soft a movement as possible. Should the piles come down, they should be fomented by cloths wrung out in hot water, to which a little Pond's Extract or fluid extract of hamamelis may be added,—one tablespoonful, or two, to one pint of water,—and when shrunken, anointed with cold cream or cosmolin, or any ointment prescribed by the physician, and returned into the bowel.

Sometimes the case is so aggravated as to necessitate keeping the patient in bed for a time. A physician should, of course, be consulted about the treatment.

Swelling and Pain of the external organs of generation and of the lower limbs, resulting from pressure and the overdistention of the blood-vessels, is best relieved by the recumbent posture.

Should the veins of the legs be much enlarged or the feet swollen, the patient should have compression made

over them by the application of a bandage (the spiral reverse of the lower limb), or she should wear an elastic stocking, such as may be obtained of any good instru-

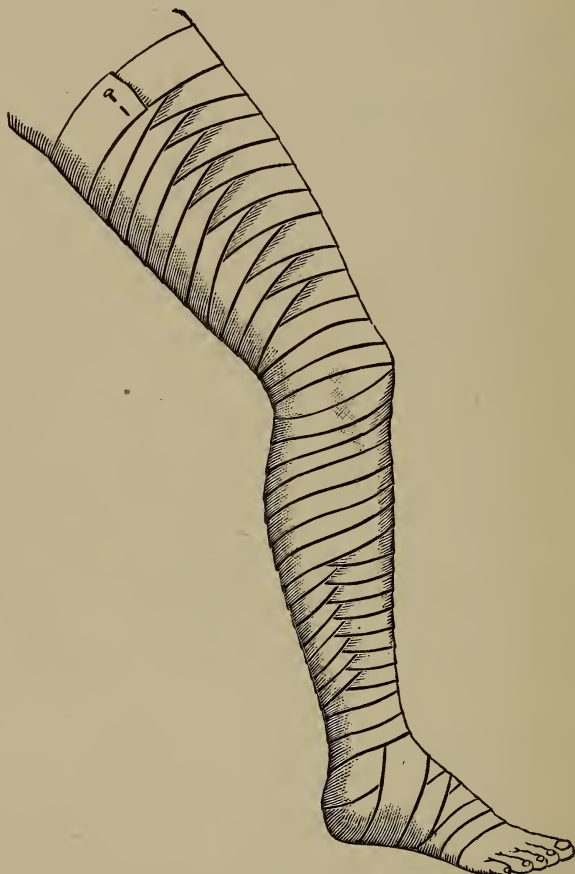


FIG. 16.—SPIRAL REVERSE BANDAGE OF LOWER EXTREMITY.

ment maker. For the bandage the best material is flannel cut bias, the width being about three inches. The bias bandage makes more even compression. Great harm may result from the neglect of enlarged

veins, as they sometimes become so distended as to burst. Prof. T. S. K. Morton has devised a method of putting on a spiral bandage of the lower extremity, which retains its place better than that just described, which is apt to loosen when the patient moves about. Dr. Morton begins the application of his bandage as in the ordinary spiral reverse bandage of the lower limb, but carries oblique turns up and down the limb until its surface is entirely covered, in place of making reverses. When this bandage is further secured in place by carrying a running line of stitches up both the inner and outer side of the limb, it keeps its place perfectly and is quite as serviceable as an elastic stocking.

Pain caused by the stretching of the walls of the abdomen may be relieved by thorough inunction of the skin. Cotton-seed, olive, or cocoanut oil may be used for the purpose.

Severe pains in the back, neuralgic in character and so severe sometimes as to prevent the patient from sleeping, may yield to change of position, relieving pressure. Rubbing with soap liniment, volatile liniment, whisky, or any liniment not too active, is helpful. Warm hip-baths may sometimes be prescribed by a physician.

The Salivary Glands are in some cases very active during pregnancy, inducing so excessive a secretion of saliva as to cause the patient great annoyance. This trouble is generally very intractable, and may refuse to yield to all treatment, ceasing only with parturition. Astringent washes, as of tannic acid, alum, myrrh, etc.,

may be tried, as also the use of pieces of ice. Physicians sometimes use atropia in small doses. Its use requires careful watching.

Bad Teeth, which occur often during pregnancy, are said to be due to acidity of the saliva. A little baking soda or prepared chalk placed in the mouth at night will counteract the effect of this acidity when it exists, or milk of magnesia may be used as a mouth wash, a teaspoonful being distributed systematically around the teeth after each meal and at bedtime. The question is often asked whether there is any danger in having the teeth filled or attended to during pregnancy. There is always some danger, because a certain amount of nerve-irritation is the result. If the patient be suffering, however, it is better to have them filled by a temporary rubber filling, which causes little pain or irritation, than to lose rest in consequence of toothache. Extraction of the teeth should only be allowed when absolutely necessary. If the pain be simply a neuralgic pain, it is better to wait.

Vomiting is, as has been mentioned in the preceding chapter, a most common accompaniment of pregnancy. It more frequently exists, perhaps, with the first pregnancy than any other. The act is accomplished, as a rule, without much effort. Diet seems to have little effect upon it. Various articles have been recommended for it, as rice water, beef-tea, barley-water, the various gruels, the yolk of a hard-boiled egg, scraped beef, in the form of sandwiches, ice-cream, cracked ice,

etc. In some cases one or another of these seems to relieve the irritation. A cup of coffee, weak tea, or milk, taken warm early in the morning before the patient raises her head from the pillow, will often act as a preventive. In extreme cases of vomiting rectal feeding must be resorted to. In obstinate vomiting it is important that the physician should examine for the position of the uterus or the existence of ulcerations or erosions.

It must not be forgotten that the constant loss of food may be so great a drain upon the patient's strength as to endanger her life. As this symptom is so largely sympathetic, the proper use of bromides or other nerve-sedatives prescribed by a physician may be of great use in checking it. In all cases of excessive vomiting a careful record of the pulse rate should be kept, for a pulse of 100 or above indicates a serious condition.

Care of the Breasts in a pregnant woman necessitates careful attention to the prevention of compression. Full development should be permitted by the looseness of the clothing. The importance of the proper dressing of growing girls cannot be overestimated in this connection. Did mothers realize the evil—of which the atrophy of the breasts is but one—resulting from tight lacing, there would be fewer unhealthy women and fewer mothers unable to nurse their offspring. The nipples should be prevented from rubbing, and the skin over the nipples should be strengthened by using the *nipple-bath*—filling a small, wide-mouthed bottle one-

third full of cold water and inverting it over the nipples daily, from five to ten minutes at a time. Sometimes a little cologne-water or alcohol is added to the nipple-bath, or, better still, borax in the proportion of one tablespoonful to the pint of water. Keeping off crusts and concretions of various kinds from the surface of the



FIG. 17.—NIPPLE PROTECTOR.

nipples by the daily use of olive oil and alcohol, equal parts, is very satisfactory. This keeps the skin pliable. The use of the *nipple protector*, which will be referred to more fully in the chapter on the management of the

lying-in, is of great importance where there is a tendency to flattening of the nipple, to remove the pressure of the clothing. Drawing out the nipple gently between the thumb and finger is also helpful in overcoming this tendency.

The Clothing of a pregnant woman should be worn loose from the very beginning, both because the breasts begin to enlarge early and because any amount of pressure upon the intestines tends to produce uterine displacements, which are especially dangerous during pregnancy, as they predispose to abortion. The clothing must be warm but light in weight, it should be supported from the shoulders. Next to the skin the patient should wear a union suit of wool or Deimel mesh. Over this, up to the fifth month, a comfortable straight-front corset may be worn, providing it does not constrict the waist; from the fifth month on the

enlarging uterus should be supported from below and the ordinary forms of corsets must be abandoned; a maternity corset, such as Berthe May's or Van Orden's, should now be worn or an elastic abdominal belt and separate breast supporter. Over the corset a chemise may be worn and a light weight silk skirt with adjustable band. The gown is preferably a loose one-piece affair made on a princess foundation or a two-piece suit consisting of an adjustable "maternity" skirt and a jacket or blouse to be worn outside of the skirt. For street wear, a long, loose wrap will be required which must not be heavy.

It is well for the stockings to be of wool or silk and side, suspender garters should be worn.

The shoes or slippers should be comfortable and with broad soles and low heels.

Many physicians insist that flannel should be worn—at least during pregnancy—both summer and winter. A lighter flannel can be substituted in summer for that which would be worn in winter. The use of flannel is to prevent chilling of the surface, and this is especially important where—as in pregnancy—the kidneys are overworked. It is important also for the condition of the heart and lungs. Coughs often cause premature labors.

Bathing is very necessary for a patient during her pregnancy, as at other times. As regards the character of the bath, she can do as she has been accustomed to, using warm or cold water. A change from warm to

cold water, or *vice versa*, is, however, not allowable. A sponge-bath, followed by brisk rubbing, is the most desirable. The skin is thus kept in good condition. Shower-baths should be avoided, also the shock of sea-bathing.

Sea Voyages are injurious, because of the danger of receiving falls or blows in consequence of the motion of the vessel, and also because of the liability to sea-sickness induced by them. When it is absolutely necessary to take a sea voyage, there is probably least danger in the last three months of pregnancy, because the placenta, or afterbirth, is then well developed and its attachment to the uterus close.

The Regulation of the Diet during pregnancy is of great importance. A patient should eat heartily for breakfast and dinner, but the evening meal should be light, especially from the seventh month on to the close of pregnancy. This meal should consist of stale bread, with butter and cooked fruit, as stewed apples, and a glass of milk or weak tea. Digestion is less active in the latter part of the day, and often a hearty meal may prove the direct exciting cause of convulsions. The food should be plain, wholesome, nourishing, well-cooked, and chosen in each case with special reference to the avoidance of digestive disturbances and constipation. Meat in moderate quantity, broths, milk, eggs, and fresh fruit should constitute an important part of the dietary. Pastry and confections should be avoided.

There is a mistaken theory prevalent in this day that

a mother, by abstaining from certain kinds of food, as meat, eggs, milk, etc., and confining herself chiefly to a fruit diet, may thus, by preventing the hardening of the bones of the child, do away largely with the pains of labor. The truth of the matter is this: that during pregnancy all the functions of the mother's body are especially active in promoting the development of the child, hence an insufficient supply of essentially nourishing food will first affect the mother's system and render her unfit for the demands upon her strength at the time of parturition.

Should a restriction to the fruit diet effect what it is claimed to do as regards the infant, it would result in the production of sickly, rachitic children, poorly developed mentally and physically.

Moderate Exercise is essential during pregnancy. Walking on a level, not riding, is the best form of exercise. A daily walk should be taken, not, however, after nightfall. The patient should avoid lifting—in fact, all straining movements—and most particularly should she avoid the use of the sewing-machine. Exercise, judiciously taken by the pregnant woman, serves to prevent undue development in the size of the child, and in this way serves to make her labor easier.

Maternal Emotions.—There is sufficient proof that the mother's emotions influence the child to render it important that her surroundings during pregnancy should be as pleasant as possible, and that she should avoid fright or any violent emotion. At the same time

there is no ground for the popular belief that when a pregnant woman is thus frightened her child will be "marked."

Complications of Pregnancy.—*Chorea*, or *St. Vitus' Dance*, *Epilepsy*, and *Insanity* are forms of nervous disorders which sometimes complicate pregnancy. Such cases require skilled medical treatment.

Patients with *heart trouble*, and those who are *consumptive*, also require constant medical supervision, as pregnancy has a deleterious influence upon them. Consumptives sometimes feel better while pregnant, but sink rapidly afterward.

Those diseases which are associated with *high temperature*, such as the eruptive fevers and inflammation of the lungs, have a marked tendency to bring on the labor before time. There is also danger of their inducing puerperal septicemia.

Syphilis is a constitutional disease and a form of blood-poisoning which also has an injurious effect upon pregnancy. If the pregnancy does not terminate prematurely, the child is usually born with the taint of the disease.

Jaundice, or icterus, during pregnancy, may be caused by the obstruction due to pressure of the gravid uterus on the liver. It is sometimes the result of acute yellow atrophy, a disease in which the liver wastes away. The patient becomes intensely jaundiced and abortion often takes place.

Displacements of the uterus, as prolapse, anteversion

and retroversion, sometimes complicate pregnancy and require careful management by a physician. For prolapse the wearing of a pessary until the uterus rises into the abdomen may be sufficient. The irritability of the bladder caused by anteversion in the later months of pregnancy may be relieved by the use of an abdominal belt, or bandage; in the earlier months by the recumbent posture. Retroversion of the gravid uterus is most serious, causing retention of urine and threatened abortion. The use of the catheter with replacement of the uterus are indicated.

CHAPTER VI.

THE EXAMINATION DURING PREGNANCY.

After missing several periods, the pregnant patient usually calls upon her physician to arrange for attendance in her approaching confinement and is directed to report at regular intervals and to send a specimen of urine for examination every month. At the first visit or subsequently, a complete physical examination is made and the pelvis is measured. Four to six weeks before the expected date of confinement, the abdominal examination is repeated and an internal examination is usually made.

Preparation for the Physician.—Provide towels, a basin of hot water, nail brush and soap, a basin of bichloride solution 1-4000, sterile rubber gloves. While the examination is in progress renew the hot water in the basin, have ready in a convenient place the pelvimeter, stethoscope, auscultation towel, pencil and tablet for taking notes and a yard-stick or tape-line.

Preparation of the Patient.—The bowels and bladder must be empty. In a private home the patient should be in bed wearing a nightgown, drawers and stockings. In office practice, the patient must remove her dress, long petticoat and corset and must loosen every band and string about the waist.

Place the patient on the bed or table in the recumbent position with a pillow under her head, roll the undervest or nightgown up to the armpits and draw the skirts and drawers down below the hips. Cover the lower extremities with a neatly folded sheet reaching to the level of the symphysis.

After examining the heart and lungs, the physician notes the size, shape and consistence of the breasts and nipples; then proceeds to palpate the abdomen to determine the height of the uterus, the relative position of the child, and whether the presenting part is engaged in the pelvic brim. After locating the child's back, the physician listens over it using the auscultation towel or stethoscope and counts the rate of the foetal pulse, usually keeping the fingers of one hand on the mother's radial pulse.

Pelvimetry.—The following measurements are usually taken:

1. Interspinous. The distance between the anterior superior iliac spines—9 $\frac{1}{2}$ to 10 $\frac{1}{2}$ inches.

2. Intercristal diameter. The widest interval between the iliac crests—10 $\frac{1}{2}$ to 11 $\frac{1}{2}$ inches.

3. Between the great trochanters. The greatest distance between the external surfaces of the great trochanters of the femurs—12 $\frac{1}{2}$ inches.

4. The external conjugate. Baudelocque's diameter, from the depression just below the last lumbar spine to the middle of the anterior surface of the pubic symphysis—8 inches.

5. Right external oblique. From the right posterior superior spine of the ilium to the right anterior superior spine— $8 \frac{3}{4}$ inches.

6. Left external oblique.

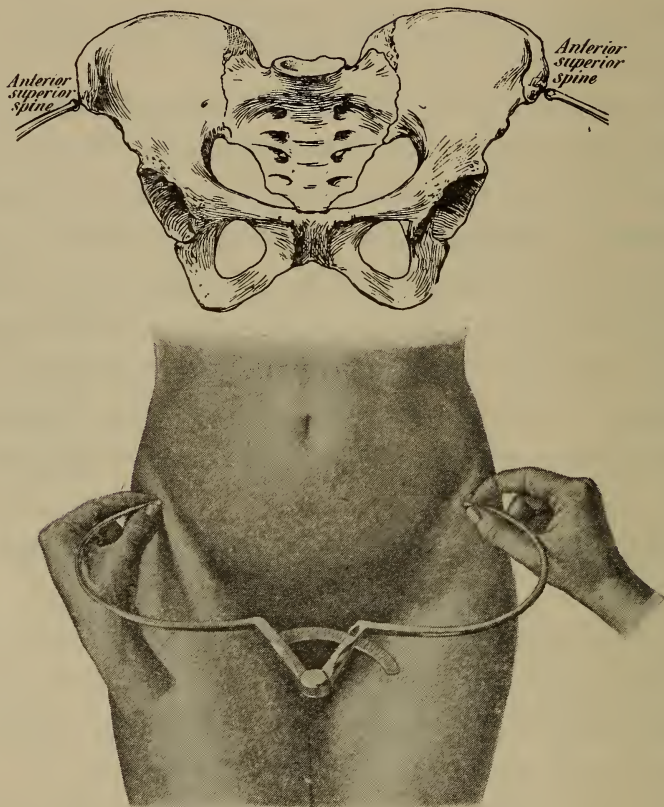


FIG. 18.—MEASURING THE INTERSPINAL DIAMETER WITH THE BAUDELOCQUE PELVIMETER.

7. Transverse diameter of the outlet. Between the tuberosities of the ischia— $4 \frac{1}{2}$ inches. The first two measurements are taken with the patient in the dorsal recumbent position; the next two with the patient in the

left lateral position; the left oblique is taken with the patient in the right lateral position and the transverse of the outlet with the patient in the dorsal position.

These external measurements give an idea of the general shape and symmetry of the pelvis rather than of its exact size. If these measurements are undersize, a careful internal measurement must be taken.

Internal Examination.—After taking the external measurements, the physician proceeds to disinfect his hands and puts on sterile gloves in preparation for the internal examination. Meanwhile, the nurse cleanses the patient's vulva, using first sterile water and green soap mixture, then bichloride solution 1-10,000 followed by sterile water. Use absorbent cotton and wipe from above downward.

By internal examination the physician determines the height and nature of the presenting part, the condition of the soft parts and the comparative roominess of the pelvic canal.

Measuring the Internal or Diagonal Conjugate.—This is the most important obstetric measurement and is taken as follows: Two fingers of the right hand are inserted into the vagina, the tips of the middle finger resting against the promontory of the sacrum while the web of the thumb is closely applied to the under surface of the symphysis. The index-finger of the left hand marks the point where the lower border of the symphysis touches the web of the right thumb and the right hand is now withdrawn. The nurse measures

with the pelvimeter the distance thus obtained—normally $5\frac{1}{4}$ inches. By subtracting $\frac{3}{4}$ to 1 inch from this measurement an accurate idea of the antero-posterior diameter of the pelvic brim is obtained. In contracted pelvises this measurement is of great importance;

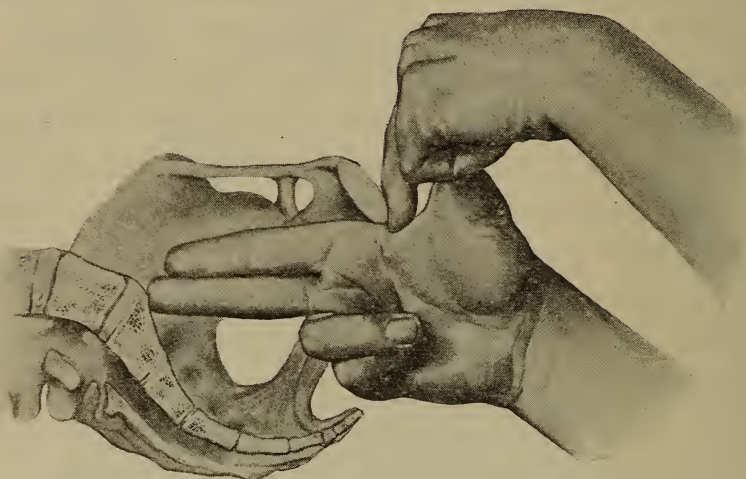


FIG. 19.—DIGITAL METHOD OF MEASURING THE DIAGONAL CONJUGATE OF THE PELVIC INLET. (*Edgar.*)

indeed, indications for the induction of premature labor or for the performance of Cesarean section may be based on this measurement alone; in some cases it is necessary to etherize the patient in order to determine it exactly.

CHAPTER VII.

ACCIDENTS OF PREGNANCY.

A Discharge of Blood from the womb, known as "uterine hemorrhage," may occur at any time during the pregnancy, and is usually a sign that the patient is threatened with a **miscarriage**.¹ However slight the flow, the nurse should have the patient lie down until the doctor has been told of its occurrence, and decides what the patient should do. A note should be sent to the doctor, telling just what has happened, and clearly making him understand the urgency of the symptoms—that is, the amount and character of the flow—and the condition of the patient. A nurse should not trust to a verbal message, as the physician may fail to respond to the call promptly, not being aware of the urgency of the symptoms. The patient should be required to use the bed-pan, or, at least, a vessel the contents of which can be thoroughly examined, both for the bowels and the passage of urine. All discharges, soiled clothing, clots, etc., should be carefully saved for the inspection of the physician.

Meantime, an effort should be made on the part of the nurse to control the flow. The patient should lie with her head low, and a pillow under her hips; she

¹ Such a flow, if excessive, is called an *antepartum* hemorrhage.

should not be warmly covered, plenty of cool, fresh air should be admitted into the room, and she should be kept exceedingly quiet.

Should the symptoms become more urgent, the patient being threatened with fainting, the head may be lowered by raising the foot of the bed, placing bricks or chairs under it in such a way as to make a decided inclined plane or bed. The patient should be fanned, given hartshorn to inhale, and her limbs rubbed, to keep them warm, with alcohol or whisky. Small doses of whisky or aromatic spirits of ammonia may be given her in cold water, if able to swallow, or black coffee or tea, not too warm. If there is much blood flowing from the vulva, vaginal injections of hot water, at a temperature of about 110° to 115° , may be kept up until the flow ceases. The physician when called may think it best to tamponade the vagina. For this purpose long strips of sterilized gauze or sheeting may be needed, which the nurse should have in readiness.

Alarming hemorrhages are often the result of accidents, falls, or blows, or they may be caused by heavy lifting.

Hemorrhage from a Low Attachment of the Placenta, or afterbirth, or when the afterbirth occupies an unusual position—that is, at the side of or over the mouth of the womb—occurs without any history of accident. It takes place at any time from the seventh month of pregnancy on to its termination, and without any premonitions of its coming. It may occur at night

while a patient is lying in bed. The management of this condition would be the same as that described above, until the doctor comes.¹

Hemorrhage from Varicose Veins.—Women suffering from enlarged, swollen veins, “varicose veins,” or “varices,” of the lower extremities, if not careful in keeping the limbs bandaged or supported by elastic stockings may have hemorrhage occur by the bursting of one of these overdistended veins. The amount of blood lost may be so great as to imperil the patient’s life. Should such a rupture of a vessel occur, compression should be made just below the point of rupture, to control the bleeding, until the physician, who should have been sent for, arrives, when he will resort to the measures necessary for securing against further hemorrhage.

Miscarriages are apt to recur, hence a patient who has once suffered from one should be cautioned to take additional care of herself during any subsequent pregnancy. Any sensation of weight about the hips, with the recurrence of a “show,” or slight discharge of blood, and cramp-like pains should warn her to lie down and send for her physician. Such a patient should also take the precaution to lie down as much as possible (if not in bed, on a lounge) during the time when, under other circumstances, she would have her monthly flow. Any

¹Rupturing the membranes is often the only way to check an antepartum hemorrhage, due to these causes. Sometimes version of the child is performed and a limb brought down in such a way as to make pressure against the detached placenta.

patient having had a number of miscarriages should keep herself under the care of her physician from a very early date in the pregnancy, being placed under a regular course of treatment.

It is well, in this connection, to speak of the importance of care in the after-treatment of miscarriages. Not uncommonly, patients, especially of the working classes, get up and go about their work a day or two after the occurrence. This is a dangerous proceeding, for, though the ill effects may not be felt for a time, chronic disease of the uterus is apt to result. If the pregnancy terminates before the fourth month it is commonly called an *abortion*. Between the fourth and seventh months it is a *miscarriage*, and after the seventh month, if before term, a *premature labor*.

It is really necessary to give more time to the recovery from the effects of an abortion than to recovery from a confinement at term, and the patient should be willing to remain in bed at least a week or ten days, or longer, if thought best by her physician. The patient should not leave her bed as long as any discharge of blood continues.

The causes of abortion may depend on some disease of the *ovum* or embryo, or it may depend on the *mother*. A frequent cause is the pouring out of blood between the two layers of the decidua. When this bleeding occurs low down, near the os uteri and is slight, abortion may not follow. When there is more blood and especially if it occurs nearer to the fundus of the uterus, the

blood forms a clot and serves to separate the ovum from its attachment to the uterus, thus causing abortion. When the ovum is expelled with the freshly formed clots around it, it is called a *blood mole*; when, however, it is retained for some time in the uterus and undergoes a change into a fleshy mass, it is called a *flesh mole*. Sometimes abortion is caused by degeneration of the chorion into a grape-like mass of small vesicles. This is called *hydatidiform degeneration of the chorion*, and constitutes a *bladder mole*. It commences at an early period of the pregnancy and almost always causes the death of the embryo. The enlargement of the uterus does not follow the regular progress that it does in normal pregnancy, and irregular bloody discharge from the uterus, containing some of these little bladders will arouse the suspicion as to the condition which exists. The uterus should then at once be emptied.

Fatty degeneration or fibrous degeneration of the placenta, the causes of which are not certainly known, also often result in abortion.

Other causes, such as fright, extreme nervousness, excessive coitus, fevers, poisonous conditions of the blood, as in syphilis, lead poisoning, carbonic acid poisoning, etc., are very numerous.

When it is impossible to prevent an abortion, the sooner the uterus is emptied the better. If the os uteri is well dilated, this may easily be accomplished by introducing the finger, after thorough sterilization of the hands, and detaching the ovum and drawing it out.

It is best always for a physician to assume the responsibility of this. When there is not enough dilatation, it can often be aided by plugging the vagina with strips of antiseptic gauze. This is best done through a speculum.

One of the most dangerous forms of abortion is when only a portion of the ovum has been expelled. This is called an *incomplete abortion*. Two dangers arise from this: *septicemia*, or blood-poisoning from decomposition of the portions of the ovum and placenta retained; and *hemorrhage* which may occur frequently as long as the uterus remains unemptied. The treatment required is to dilate the uterine os under chloroform or ether, and to carefully remove all that remains of the ovum.

Sometimes a small portion of retained placenta forms a kind of polypus and is called a *placental polypus*, its attachment to the uterine wall being quite firm. It will need removal as any other form of uterine polyp.

Certain drugs, such as ergot, cannabis indica, savin, quinine, etc., called oxytocics, have the power to cause the uterus to contract and may cause abortion. They should, therefore, be avoided during pregnancy.

Premature Rupture of the Membranes enclosing the child, with a discharge of colorless liquid, commonly known as "breaking of the waters," is another of the accidents of pregnancy, and is invariably followed, within a few days, at least, by the expulsion of the child. The patient will complain of her clothing becoming wet, either by a sudden discharge of a quantity

of liquid, or by a slow but continuous flow. The nurse can assure herself that this liquid is not urine by her sense of smell. The smell of urine is characteristic. With the amniotic liquid surrounding the child, there is almost an entire absence of smell, a peculiar, faint, musty odor alone being recognizable.

It is best, in removing this wet clothing from the patient, to set it aside, that the physician may judge for himself of the character of the liquid. The patient should at once lie down, not taking the erect position for any cause, not even for defecation and urination, and the physician should be sent for, with a written statement as to what has occurred. It is important that the physician should see the patient as soon after the rupture of the membranes as possible, because the sudden loss of water may have brought about changes in the position of the child which may endanger its life. The loss of the entire amount of liquid contained in the sac would cause also difficulties in the delivery, or what is known as "a dry labor."

Convulsions, or eclampsia, may sometimes occur during the pregnancy. The symptoms which threaten this trouble are extreme restlessness and uneasiness on the part of the patient; diminution in quantity of urine passed, severe headache, often confined to one side of the head; disorders of vision, as seeing things double, or seeing but the part of an object, sometimes very imperfect vision, and occasionally absolute loss of sight; twitchings of the muscles, especially of the face, may

occur. The convulsion is ushered in by this restlessness and twitchings, beginning first about the eyes and extending rapidly to the mouth, arms, and lower extremities. The movements are not violent, hence the patient is not likely to throw herself out of bed.

During the convulsion the tongue may be bitten and the lips covered with blood-stained mucus; spasm of the diaphragm results in arrest of breathing and marked cyanosis. After one or two minutes' duration the muscular spasm relaxes, the convulsion terminates in a long inspiration and the patient passes into a state of coma. She lies unconscious, with flushed face, snoring respiration, full pulse, and elevated temperature. This state may last an hour or more, the patient gradually regaining consciousness if treatment has been successful or, if otherwise, repeated convulsions occur during one of which the patient may die or in some cases death results from œdema of the lungs. Upon the first onset of eclamptic symptoms the physician should be sent for meantime, the nurse should see that the patient is kept lying down, that her clothing is well loosened, especially about the head and chest, that plenty of fresh air enters the room, and that the patient is kept from biting her tongue. A folded handkerchief or towel slipped in between the teeth pushes back the tongue and prevents the teeth from coming down upon it. False teeth should be removed, the room should be darkened and sudden noises, loud talking and jarring of the floor or bed must be prevented.

The patient's feet should be kept warm and head cool. The members of the family must be kept calm and prevented from meddlesome interference, for the attempt to make the patient swallow any stimulant while struggling and unconscious may result very disastrously. Should the attending physician live too far away or be delayed in coming, the nearest physician should be sent for.

Eclampsia is caused by some organic poison produced during pregnancy and imperfectly eliminated, as a rule because of kidney disease. Treatment is directed toward eliminating the poison and terminating the pregnancy. Three avenues of elimination are available—the skin, intestines, and kidneys. Hot packs stimulate copious elimination by the skin.

Method of giving a Hot Pack.—Under the patient place a rubber blanket covered by a wool blanket, arrange four hot-water bottles or four hot bricks wrapped in bath towels on each side of the patient far enough away from her to avoid any possibility of burning, then cover all with a second wool blanket and rubber blanket. Put an ice-bag to her head and watch the pulse and respiration; if the pulse becomes feeble or irregular or the respirations shallow the pack must be discontinued, but if well borne the patient may remain in it for thirty minutes after sweating begins. At the end of this time remove the rubber blankets, bricks or bottles, sponge the patient off with warm alcohol and leave her between dry blankets. Such a pack may be re-

peated once in three or four hours; in the intervals between packs salt solution is administered continuously by rectum or subcutaneously and hot flaxseed poultices are applied to the kidney region .

To empty the bowels one drop of croton oil is given in a few drops of olive oil placed well back on the patient's tongue or 10 grains of calomel are placed dry on the tongue.

As soon as possible the physician ruptures the membranes; this causes a sudden fall in blood pressure and stimulates uterine contractions which, under the influence of the hot packs, usually result in spontaneous delivery within a few hours; otherwise, resort must be had to some form of operative delivery.

Blood-letting is sometimes necessary to relieve excessive arterial tension; nitroglycerine or veratrum viride are given for the same purpose. Chloral or chloroform may be used to control the spasm and oxygen inhalations are useful during coma. The patient's lips must be wiped off frequently with gauze wet in listerine or boric acid solution.

CHAPTER VIII.

THE ANATOMY OF THE FŒTAL HEAD AND THE MECHANISM OF LABOR.

The fœtal head is the part of the child's body which, in a natural labor, is expelled first. It is the firmest and most resistant part, and where it passes the rest of the body easily follows.

The bones of the fœtal skull are usually considered under two heads, those composing the *cranium* or vault of the head and those of the *face* and under surface of the skull.

The bones of the vault are as follows: One frontal, or forehead bone; two parietal or side bones; one occipital bone, at the back of the head; two temporal bones, one sphenoid, and one ethmoid. The last two mentioned are of no especial importance obstetrically considered.

In the face there are fourteen bones; but these also are not of obstetrical value.

The bones of the vault are joined together by cartilage so that when pressed together in labor the size of the head is diminished and it is allowed to pass through the pelvis with greater ease.

The lines of union between these bones are called *sutures*. The most important of these are:

1. The coronal suture between the frontal and parietal bones.

2. The sagittal suture running from the posterior angle of the bregma (or large fontanelle) to the lambdoidal suture at its junction with the posterior fontanelle.

3. The lambdoidal suture, between the occipital bone and the parietal bones posteriorly.

These three are the sutures which it is most important to be able to recognize by touch, as they may be reached most readily during labor by the examining finger.

4. The frontal suture is the division down the middle of the forehead between the two parts of the frontal bone.

5. The two temporal sutures, one on each side, are the lines of separation between the temporal and parietal bones.

The *fontanelles* are membranous spaces between the cranial bones where the sutures meet. The most important are:

1. The anterior or greater fontanelle.

2. The posterior or lesser fontanelle.

The anterior fontanelle is lozenge-shaped and about large enough to be covered by the tips of two fingers. Four sutures terminate in it; the two halves of the coronal suture, the sagittal suture, and the frontal suture. It is the only fontanelle having four sutures meet it.

The posterior fontanelle is not always a membranous

space. Here three sutures meet: the two portions of the lambdoidal and the posterior extremity of the sagittal. There is another triangular-shaped fontanelle which may be felt at the side of the head called the *posterior temporal fontanelle*. This may be distinguished from the posterior fontanelle by its close proximity to the ear.

It is necessary to take certain *measurements* or *diameters* of the foetal head in order to compare them with

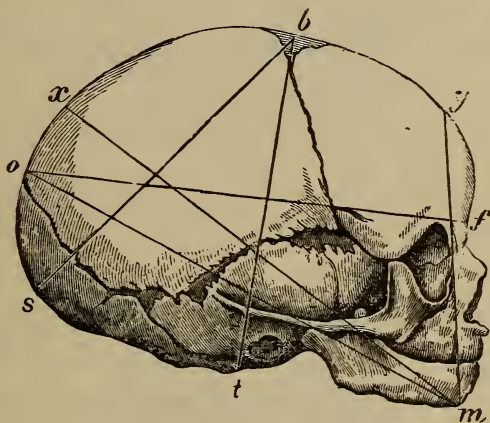


FIG. 20.—THE FŒTAL SKULL (DIAMETERS).

of. Occipito-frontal. *om.* Occipito-mental. *xm.* Maximum. *bs.* Suboccipito-bregmatic. *tb.* Trachelo-bregmatic. *ym.* Fronto-mental.

the diameters of the pelvis. The average size of the foetal head is thus determined. When the head is too large there is difficulty in its passing through the pelvis.

The most important *diameters* are the following:

1. The occipito-frontal (written O. F.), the distance between the center of the frontal bone, at the root of the nose, and the upper part of the occiput. It measures about 4 $\frac{1}{2}$ inches.

2. The occipito-mental (O. M.), the distance between the middle of the chin and the upper part of the occipital bone. It measures about 5 to 5 $\frac{1}{2}$ inches.

3. The bi-parietal (B. P.), between the two parietal eminences, about 3 $\frac{1}{2}$ or 4 inches.

4. The bi-temporal (B. T.) between the two temples—about 3 inches.

The occipito-mental is the longest of the foetal diameters, excepting when the head has been so moulded during labor that its shape has been changed by the pressure of the bones of the pelvis. The longest diameter after labor is called the *Maximum diameter* (M.), and extends from the point of the chin to a variable point on the back of the head. It measures about 5 $\frac{1}{2}$ inches.

The head of the child may be safely compressed to a certain extent from side to side, but not from before backward. When there has been much delay in the birth and much pressure from the pelvic bones, the child's head often seems quite distorted in shape. No effort should be made to press it into shape again. In a few days it will return to its normal shape.

The mechanism of labor consists in the movements made by the presenting part of the child (usually the head) in its passage through the pelvic canal.

For a normal mechanism the foetal head should be of a proper size to fit the pelvis through which it has to pass.

The foetal head may enter the pelvis in four different positions, as follows:

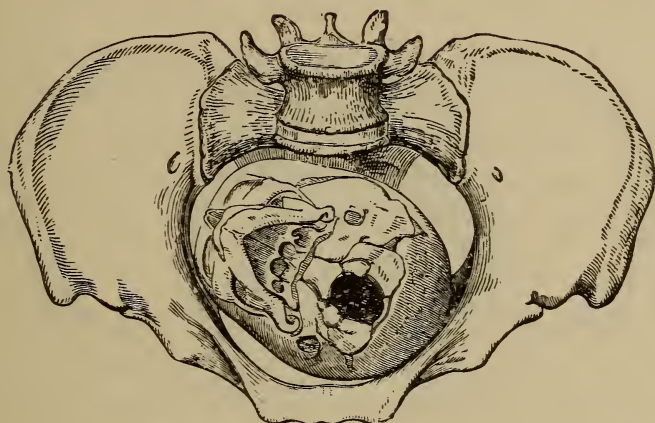


FIG. 21.—LEFT OCCIPITO-ANTERIOR POSITION.

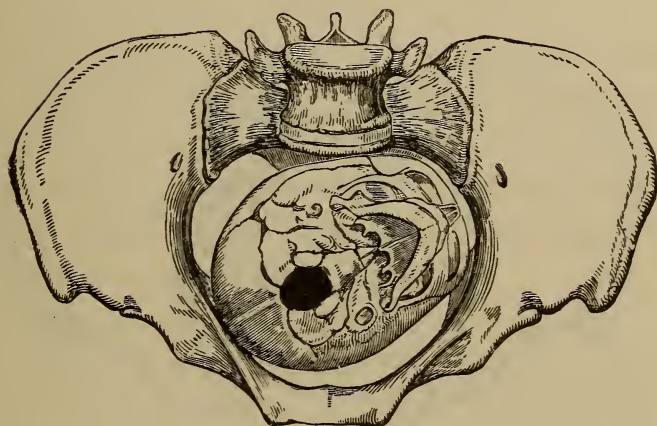


FIG. 22.—RIGHT OCCIPITO-ANTERIOR POSITION.

1. Left occipito-anterior (L. O. A.), the occiput or vertex being directed toward the left acetabulum or socket of the hip joint.

2. Right occipito-anterior (R. O. A.), the occiput being directed toward the right acetabulum.

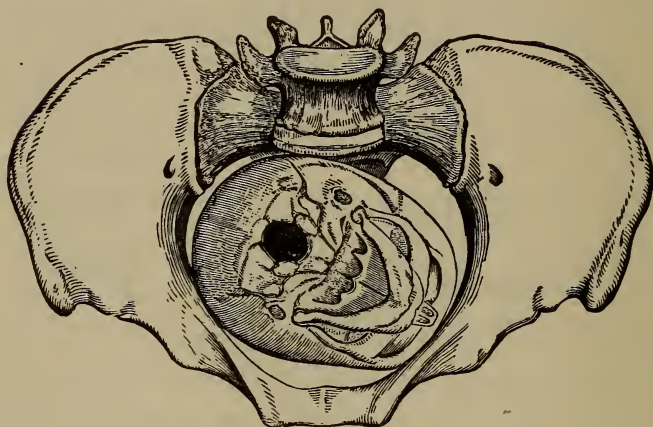


FIG. 23.—RIGHT OCCIPITO-POSTERIOR POSITION.

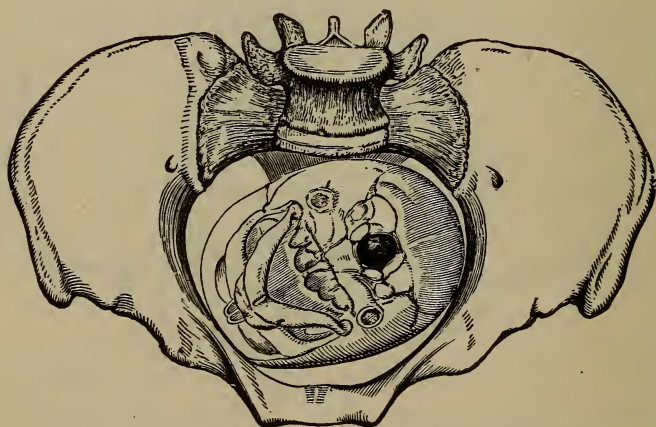


FIG. 24.—LEFT OCCIPITO-POSTERIOR POSITION.

3. Right occipito-posterior (R. O. P.), the occiput being directed toward the right sacro-iliac articulation.

4. Left occipito-posterior (L. O. P.), the occiput being directed toward the left sacro-iliac articulation.

Some obstetricians consider the third position to rank second in frequency of occurrence. In both the first and third positions the sagittal suture of the child's head lies in relation with the right oblique diameter of the pelvic inlet, and should be felt by the examining finger. In the first position the posterior fontanelle is directed forward, the anterior fontanelle being backward. These positions are reversed in the third position of the head. In the second and fourth positions the sagittal suture lies in relation with the left oblique diameter.

In its passage through the pelvis the head undergoes certain movements as follows:

1. Flexion with Descent, the child's head being bent forward so that its chin rests upon its chest; at the same time that the head descends into the pelvic canal.

2. Internal Rotation—the occiput moving toward the anterior part of the pelvis until it finally becomes fixed under the pubic arch.

3. Expulsion with Extension of the Head.

4. External Rotation, or Restitution, the occiput being again directed toward the side of the pelvis it originally occupied. This occurs outside the pelvis, while the body of the child is turning inside the pelvis in such a way as to accommodate the shoulders in the antero-posterior diameter of the outlet.

In consequence of obstructions to the passage of the

head into the pelvis, *irregular mechanisms* are sometimes brought about and the labor is rendered abnormal. A physician should always be at once notified when there is any complication of this kind observed. The occiput meeting with some resistance, may be held at the brim and the uterine contractions acting through the spinal column of the child, may force down the anterior part of the child's head. In this way *brow* or *forehead* presentations and *face* presentations occur.

In *brow presentations* the anterior fontanelle, the forehead and the ridges above the eye sockets are felt by the examining finger. The head cannot be born in this position, which must be changed so that the *occiput* or the *face* comes down.

In *face presentations* the extension of the head is more extreme and the examining finger reaches the nose, mouth and chin of the child.

Face presentations are named from the direction toward which the chin points. From the Latin word signifying "chin" these are termed mental presentations, as follows:

1. Right mento-posterior (R. M. P.) in which the chin is directed toward the right sacro-iliac articulation.
2. Left mento-posterior (L. M. P.) in which the chin is directed toward the left sacro-iliac articulation.
3. Left mento-anterior (L. M. A.) in which the chin points to the left acetabulum.
4. Right mento-anterior (R. M. A.) in which the chin points to the right acetabulum.

Face presentations occur once in about 230 births. In the majority of cases the delivery in face presentations may be accomplished without any operative interference. The mechanism is similar to that which occurs in occiput or vertex presentations excepting that the *chin*

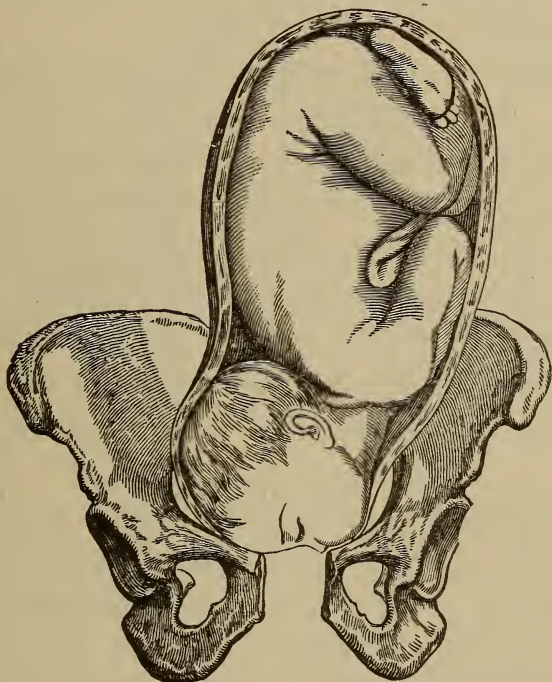


FIG. 25.—PRESENTATION OF THE FACE IN THE SECOND FACIAL POSITION.

rotates to the anterior portion of the pelvis, in place of the occiput; and the head is expelled by a movement of *flexion* instead of *extension*; by this means the occiput sweeps over the perineum instead of the face, as in vertex presentations. The labor is always a prolonged one and the membranes are apt to be ruptured pre-

maturely because of the irregular shape of the presenting part. Sometimes also the cord becomes prolapsed. These facts all add to the danger of the child during the birth. The mother suffers from the long-continued pressure on the pelvic tissues and the perineum is very apt to be badly torn because of the way in which the head is expelled.

The rotation of the occiput into the hollow of the sacrum and the rotation of the chin in the same way always require operative interference, excepting in cases where there is practically no mechanism of labor because the pelvis is large and the child's head small and expulsion takes place rapidly.

When there is difficulty or too long delay in the birth in head presentations, the use of forceps may be called for and the nurse will need to have everything in readiness.

Caput succedaneum is a term applied to the puffy swelling which appears on some part of the child's head during labor by an effusion of serum under the scalp. It is caused by the pressure of the os uteri in the first stage of labor and by the pressure of the pelvis during the second stage. Its situation varies with the position of the head. After birth it rapidly disappears because pressure is removed. Its presence often interferes during labor with the examiner's efforts to learn the exact position of the head.

Pelvic presentations are of three varieties: *breech*, *knee*, and *foot* (called *footling*).

The *breech* presentation is the most common of these because of the *attitude* which the foetus normally occupies in the uterus.

By the *attitude* of the *fœtus* we mean the relation which the foetal parts bear to each other.



FIG. 26.—BREECH PRESENTATION, THE LEGS EXTENDED.

The usual position of the child is with the knees drawn up toward the abdomen and the heels close to the nates, the feet being flexed upward toward the legs. The child's head is bent forward on the chest, the arms are crossed over the breast. The breech of the child in this position is most readily felt by the examining finger,

when it presents at the inlet and may be recognized by feeling the tip of the coccyx, the anus, and the genitalia. Sometimes the feet can be felt at the same time. Occasionally the child's thigh becomes stretched out and a foot comes down lower than the breech. This constitutes a *footling* presentation. It is more frequent than the knee presentation, which is produced by the leg becoming bent backward so that the knee presents at the os uteri.

In a large number of pelvic presentations labor occurs prematurely and there is little difficulty in the mechanism.

The breech may present in two ways; either with the back turned forward (dorso-anterior); or the back turned toward the mother's back (dorso-posterior). The dorso-anterior positions are the most common.

By external examination one may discover a breech presentation by feeling the head of the child, like a hard ball, through the abdominal walls, in the upper part of the uterus.

The different positions of the breech at the inlet have been named, as follows:

1. Left dorso-anterior (L. D. A.). The examining finger here discovers the posterior surface of the sacrum directed toward the left acetabulum.
2. Right dorso-anterior (R. D. A.). The posterior surface of the sacrum is directed to the right acetabulum.
3. Left dorso-posterior (L. D. P.), the sacrum directed to the left sacro-iliac articulation.

4. Right dorso-posterior (R. D. P.), the sacrum directed to the right sacro-iliac articulation.

Positions of knee and footling presentations are determined in the same way. The position of the heels of the child will enable the position of the sacrum to be decided in any footling presentation.

The movements, or mechanism of labor in a breech presentation are as follows:

1. Compression with descent of the breech into the pelvis.

2. Internal rotation until the anterior thigh is brought under the pubic arch.

3. Expulsion of the posterior thigh first followed by that of the anterior thigh and the trunk as far as the shoulders.

4. Fixation of the anterior shoulder under the pubic arch.

5. Expulsion of the posterior shoulder first followed by that of the anterior shoulder.

6. External rotation of the body with the back looking upward—at the same time internal rotation of the head.

7. Fixation of the nape of the neck under the pubic arch.

8. Expulsion of the head by a movement of flexion, the face and vault sweeping over the perineum, while the body of the child is extended up toward the mother's abdomen.

All breech deliveries are apt to be tedious and there is

a temptation to hurry them by seizing the legs and thus extracting the child.

This is very dangerous, for if the legs are seized and the body rapidly drawn down the chin is drawn away from the chest and the result may be a malposition of the aftercoming head; or the arms may be drawn away from the chest and extended. These accidents cause delay of the head in the pelvis and pressure on the cord and often cause the death of the foetus.

In every labor, in a breech presentation, the greatest danger comes after the shoulders are born—while the head is still in the pelvic cavity. Up to that time the attendant on the labor is required to do nothing, unless it be simply to draw on the cord a little to loosen it, if it seems to be pulled on too much during the expulsion of the body.

Assistance usually needs to be given, however, in extraction of the head for the child is in great danger of suffocation, if there be the least delay. To effect this, the fingers of one hand may be hooked over the shoulders of the child, while the fingers of the other are introduced into the mother's vagina and a hold obtained by them in the child's mouth or on each side of its nose. The body of the child may ride the operator's arm. The head is then by gentle traction drawn out in the same manner in which it would be naturally expelled.

Knee and footling presentations have practically the same mechanism as the breech and the rules for management are the same.

Transverse presentations are those in which the long diameter of the child lies in relation with the transverse diameter of the uterus. These are sometimes called *shoulder* or *arm* presentations because the shoulder or arm almost always is, sooner or later, forced down into the pelvis. In these there is much danger both to

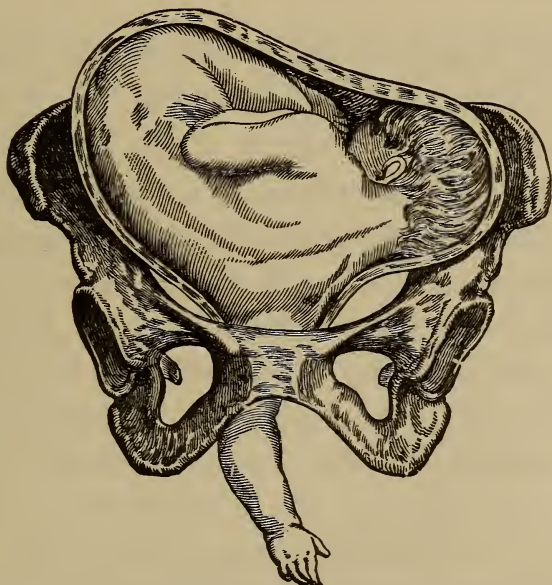


FIG. 27.—PRESENTATION OF RIGHT SHOULDER.

mother and child, especially when the presentation is not recognized before the membranes rupture. If recognized early, this malpresentation may be converted into a normal one by version, or turning.

There are two principal varieties of transverse presentations. In the first, the child's back is forward toward the mother's abdomen (dorso-anterior); in the second it is turned backward, towards the mother's

back (dorso-posterior). The dorso-anterior positions are much the most frequent.

The child's head lies in either the one or the other iliac fossa, and either the *right or left shoulder* may present at the inlet.

This gives us four positions in shoulder presentations as follows:

1. Dorso-anterior position of the right shoulder.
2. Dorso-anterior position of the left shoulder.
3. Dorso-posterior position of the right shoulder.
4. Dorso-posterior position of the left shoulder.

By external examination the transverse presentation may be recognized from the shape it gives the abdomen which will be wider across than in its longitudinal diameter. The head of the child may also be recognized in one or other side of the abdomen. By internal examination the absence of the head at the inlet will be noted. When the os begins to dilate the pouch of membranes will take on an elongated sausage-like form. After the membranes have ruptured, the shoulder, the elbow, or the head may be felt; also the ribs may be recognized.

The transverse presentation must always be changed before delivery can be effected. Even without artificial aid, nature makes an effort to change the presentation by the action of the uterine contractions, and to terminate the labor either by *spontaneous version* or *spontaneous evolution*.

In spontaneous version the presentation is changed to the breech or the head.

In spontaneous evolution the foetus is driven through the pelvic canal, the head remaining above the brim and the body of the child becoming doubled up and thus pushed through the pelvis with the arm still presenting. The child is, of course, born dead, and the injury which the mother suffers from the hard labor may cause her death.

The proper treatment, therefore, is to perform version early; converting the transverse presentation into a breech or vertex.

CHAPTER IX.

PREPARATIONS FOR THE LABOR.

The relations between nurse and patient begin from the time the engagement is made for a nurse's attendance upon the confinement.

The nurse is generally consulted beforehand as to the articles that will be needed at the time of the confinement and for the baby's outfit. Also, she is sometimes asked concerning the choice of a room for the labor and lying-in.

The room is a most important consideration. It should be light, having free entrance of sunlight, quiet, and well ventilated. It should be kept at a temperature of 70° in winter.

The Mother's Dress.—She should be advised to have a sufficient number of good-sized merino or flannel vests, to be able to change night and morning, so that the same vest shall not be worn both day and night. These are more readily changed if opened all the way down the front and fastened with tapes. The free action of the skin after delivery necessitates the use of flannel or merino to prevent chilling. If a long night-dress is worn, there is no necessity for the chemise. The night-dress, also, should be opened all the way down the front, as it renders easier for the patient the frequent

changes which are necessary. Sufficient night-dresses and vests should be provided to make it possible for the clothing to be changed every day.

Two or three *abdominal bandages*, also, should be provided, either fitted to the patient's person or straight. If fitted, the bandages should be prepared when the

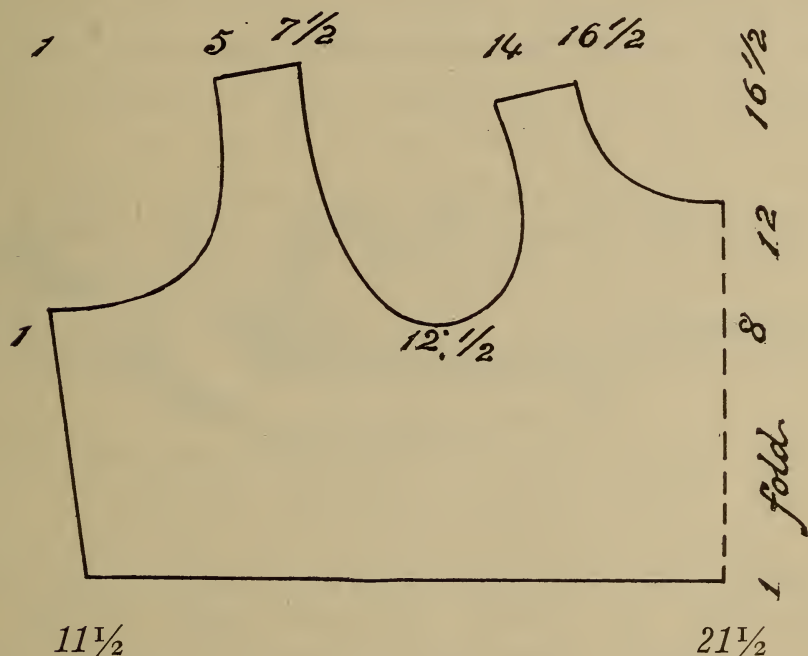


FIG. 28.

patient is about six months pregnant, to be the right size after delivery. The bandage should extend from the pubic bone (the bone just above the external generative organs) to the breast-bone, being about a half-yard wide and long enough to go once around the body and overlap one-third. It is best made of soft muslin

doubled, the seams being turned in at the edges. Large safety pins should be provided for fastening this bandage down the front.

Where the breasts are large and pendulous, some bandage will be required for their support. A diagram of the breast binder used in the Woman's Hospital is shown in Fig. 28. These are made of two thicknesses of muslin, turned in along the edges and stitched together. Two breast binders should be prepared.

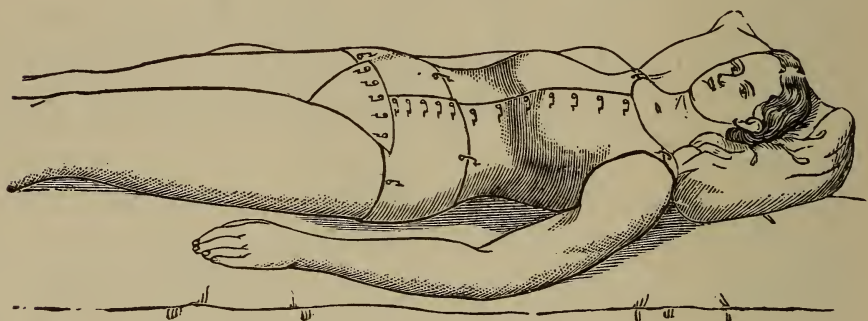


FIG. 29.—OCCLUSION DRESSING. (*Garrigues.*)

When the physician does not require the aseptic dressings, now almost universally used, at least two dozen *napkins* of diaper linen should be provided for the mother, as very frequent changes of the napkin are essential during the first few days after the delivery, while the discharges are free. The napkins should be baked before they are used.

The aseptic dressings used in the Woman's Hospital of Philadelphia consist of absorbent cotton pads ten inches by three and two inches thick, wrapped in

pieces of absorbent gauze twenty inches square. These are wrapped in packages and sterilized by steam on three successive days. In private practice, three dozen should be prepared, wrapped in towels or old muslin in packages of six and baked in an ordinary oven for one hour.

When removed they should be kept enclosed in the towel without opening until required for use.

The dressing is tightly fastened to the abdominal bandage, both anteriorly and posteriorly, by means of safety-pins, and the access of air to the vagina is thus prevented. They are changed at least once in three hours, the dressing removed being at once burned. It is seldom necessary to continue the dressings longer than two weeks. They should be kept up, however, so long as the discharge persists.

After the above statement, it will be seen that a nurse should have the patient obtain twelve yards of cheese cloth and two pounds of absorbent cotton.

In winter it is well for the mother to be provided with a woolen bed sack.

For the confinement bed the patient should provide two pieces of rubber-cloth, a yard and a half square. For a single bed two rubber army blankets may be used, if, as in the maternity practice in the Woman's Hospital, it is desired to cover the whole bed. The arrangement of the bed will be explained in a later chapter. White rubber gum-cloth is the best when it is obtained in the piece. If the patient is poor, table oil-cloth may be

used; it is cheaper and answers the purpose as well; or layers of newspapers tacked together will make very good temporary pads.

A piece of floor oil-cloth is the best *protection for the carpet* at the side of the bed.

Rubber-cloth should never be used but for one confinement. The rubber cracks when folded and put away, and no longer serves its purpose of protecting the bed. Then, too, it is very important to be sure that everything about the confinement bed is perfectly fresh and clean. Hence a rubber-cloth used for confinement should neither be borrowed nor lent.

Sleeping on rubber-cloth makes a person perspire, hence it is desirable to get rid of it as soon as one can. It is seldom necessary to use it after the fifth or sixth day.

Other articles necessary to have on hand will be half a dozen old sheets, about a dozen towels, a new syringe (a fountain syringe, large size, is the best), a bed-pan (square pattern), nail-brush, white Castile soap, a jar of cosmolin or vaselin, a bottle of antiseptic tablets (corrosive sublimate), one pound absorbent cotton, two yards of nursery cloth, two papers of large safety-pins, one paper of small safety-pins, four ounces tincture of green soap, four ounces of brandy, one pint of olive oil, two half-pound cans of ether.

I desire, in this connection, to emphasize the fact that the **syringe** should be a new one. This is an antiseptic precaution. Hence advise the patient strongly

against the use of any syringe which may have been used for other purposes, however well it may work. Of course, the borrowing of such an article from a neighbor or friend should be strongly discountenanced.

The Baby's Clothes.—If they are made too elaborate they will not be washed often enough, hence they should be *plain*. As the depressing influences of cold are very injurious to babies, the clothing should be *warm*, hence a flannel garment with long sleeves and high neck should be worn next the skin, the thickness varying with the season of the year. The activity of the life-processes makes it important that every organ of the body should be unimpeded in its action and free from pressure, hence the clothes should be very *loose* and *light* in weight.

The only articles absolutely needed to constitute an *outfit* are: 1. a soft flannel shirt, with high neck and long sleeves, opened in front. This is better than the merino vests or the knit shirts, which shrink on washing, and are then difficult to put on and take off. 2. A binder, or bandage of fine, soft flannel, six inches wide, and long enough to go around the abdomen once and lap over about one-third (22 inches long). This should be made without a hem, the raw edge being overstitched to prevent raveling. The binder is best fastened by means of two pieces of tape attached to one of its edges.

This arrangement does away with the necessity for pins in fastening the binder, the pieces of tape being simply wound around the body to secure the binder, and tucked in at one edge. Some prefer the knitted

wool band, made of single zephyr and knitted in the ribbed stitch, as wristlets or mittens are often knit, to permit of greater elasticity. These bands are made a little narrower in the center than at either extremity, so as to be held in place better. They are made perfectly circular, just like a wristlet, and are so elastic that they can readily be drawn up over the limbs and adjusted to the body. 3. A napkin of cotton or linen diaper is the best; Canton flannel makes a very poor baby's napkin, as it becomes stiff when washed. Napkins are generally made too large for a new-born baby, and require to be folded into too many thicknesses. A napkin which when folded once is half a yard square, is of ample size. The number of napkins supplied should be generous, so as to permit of frequent washing and thorough airing. Napkins should always be fastened by safety-pins. For the protection of the outer garments from dampness due to frequent urination, it is well to have a second napkin folded and laid beneath the baby's hips. The use of rubber-cloth over the napkin for this purpose is much to be condemned, as it overheats the parts and makes the skin tender. 4. A flannel slip of heavier or lighter texture, according to the season, serves the purpose both of petticoat and dress. This should be made just long enough to cover the baby's feet—about twenty-five inches from neck to hem, and should be fastened in front. The ordinary fashion of making a baby's clothes very long is objectionable because of the greater weight of the clothes preventing free movements of the child's limbs

and the development of its muscles. The object of fastening the clothing in front rather than in the back is to avoid the necessity of the baby's lying on the uneven surfaces produced by buttons, tapes, and hems, which no doubt are often a source of discomfort to its tender skin. 5. Knit woolen socks are necessary to keep the baby's feet warm, and it is well to have them extend pretty well up the leg, reaching even to the knee, as cold feet are often an exciting cause of colic.

The above are the only essential articles of clothing for a baby. Should the mother prefer, for the sake of effect, to see her baby in white muslin, a slip of muslin can be worn over the flannel slip. These garments do away with all waistbands and the constriction of the chest thereby induced. Should the garments be made with waistbands, they should be supported from the shoulders by means of straps, or armholes should be made in the bands, just as in the case of an older child; they will not need then to be drawn so tightly around the child to be retained in place.

A heavy blanket is not needed to wrap the baby in, in a room at the temperature of the lying-in room—from 68° to 70°; but should it be carried from one room to another, or when it sleeps, a blanket, or some wrap, ranging in weight with the season, will need to be thrown over it.

When a baby has but little hair on its head, and shows a tendency to catch cold readily, a plain cambric or light flannel cap may be employed as a head covering.

This is a preventive against catarrhal troubles affecting the nose and throat.

An outfit for babies which has obtained much favor among mothers is called the "*Gertrude Suit*," and consists of three garments: The first, or undergarment, is made of soft flannel, and is long enough to extend from the neck to ten inches below the feet. The next garment, cut in the same way, but half an inch larger and five inches longer, is made of muslin. Over these comes the "slip," also Princess style, and the only one of the garments with long sleeves. (This is the most objectionable feature of the suit; a baby's arms should be well covered.) It has a longer skirt than either of the other garments. All are fastened behind by small buttons. These three garments are put together and all slipped on to the baby at one time, facilitating the process of dressing very much.

In our opinion, however, this suit has not the same advantage as that worn in the Maternity of the Woman's Hospital of Philadelphia, and first described. The fastening of the clothing in front, the fewer number of articles comprising the wardrobe, and the fact that they may be very easily taken off and put on, while they meet all the requirements of warmth, looseness, and lightness, make this outfit preeminently a comfort to the baby.

It is well to provide a *lap-protector* for the mother or nurse who shall have the baby in charge. This may be made of any thick wash material, and if shaped like a

pillow-case, and fastened at one end by buttons, a piece of rubber sheeting can be slipped inside of it. The rubber can be slipped out and the case washed as often as necessary.

The articles provided for the *baby-basket* may be the following:—

Three or four pieces of linen bobbin, about eight inches long.

A pair of blunt-pointed scissors.

Large and small safety-pins.

Several small squares of soft linen, about four inches square, for dressing the cord, and two inches square, for washing the eyes and mouth.

A soft hairbrush.

A powder-box and puff, with lycopodium or fine starch powder, or plain talcum. (The scented powders are often irritating.)¹

A small jar of cold cream.

Two soft towels.

A full suit of clothes, as described above, for the baby.

A woolen shawl or wrap.

¹ Many obstetricians discard the use of all powders for a baby's skin.

CHAPTER X.

SIGNS OF THE APPROACHING LABOR—THE PROCESS OF LABOR.

Certain changes take place during the latter part of the ninth month which indicate that labor is approaching. One of these is the *sinking of the abdominal enlargement*. The upper part of the womb, which has at the beginning of the ninth month been high enough to reach the pit of the stomach, comes down gradually to a point about mid-way between the extremity of the breast bone and the navel. This sinking of the womb is known as “descent” or “settling” of the child, and indicates that the head of the child, which is ordinarily the part to be borne first, has stretched the lower part of the womb and is finding its way into the cavity of the pelvis, through which it must pass in the birth. Great relief to the mother results from this descent of the womb, as the lungs are no longer pressed upon to the same extent as before. The change in the position of the womb produces, however, an increased amount of pressure on the lower portions of the body. Swelling of the lower limbs is apt to result in consequence of this, and walking is rendered difficult. Piles, or hemorrhoids, are apt to form, and irritability of the bladder to exist.

During the last two weeks of pregnancy the patients are apt to suffer from what is known as "*false pains*." These are cramp-like pains, so much like labor pains that patients are often deceived by them, and led to imagine that the labor is really coming on. They are called "false pains" to distinguish them from the pains of labor, which are known as "*true pains*." The way to distinguish between the two kinds of pains is to observe whether there is any regularity as to the time of their occurrence; also, whether the interval grows shorter, and whether, with this shortening of the interval, the pains grow stronger. "False pains" are irregular in their occurrence, while "true pains," though starting perhaps at quite long intervals, as three-quarters of an hour or a half-hour apart, gradually come nearer together and grow stronger. "False pains," also, are generally located in the abdomen. "True pains" more frequently start in the back, coming forward to the abdomen and extending down the thighs. A strong "pain" is apt to be followed by one or two weaker pains. A nurse, if in doubt as to whether the pains are real labor pains or not, should have the physician sent for, who will make an examination to learn what the condition of the parts may be. A sign that makes it probable that the labor is really coming on is the appearance of what is known as the "*show*," a discharge of mucus, tinged with blood, which comes from the mouth of the womb, and indicates that the stretching of the mouth of the womb is taking place.

The whole process of labor is divided into *three stages*. The *first* is the *stage of dilatation*, when the mouth of the womb is stretching so as to allow the child to pass through it. With women who have never borne children this stage lasts on an average fifteen hours, while it is a very variable period for those who have previously borne children—sometimes lasting but three or four hours; the average time given is from seven to eleven hours.

The *second* stage of labor begins after the completion of the stretching of the mouth of the womb and ends with the *birth of the child*. For women with their first birth, this period lasts from an hour to an hour and a half; with others, from twenty minutes to an hour.

The *third* stage of labor includes the interval between the expulsion of the child and the *coming away of the afterbirth*—on an average a half an hour or twenty minutes.

The time for the entire labor, in a case where it is the first birth, is about seventeen hours. In cases where other children have previously been borne, the average is from eight to twelve hours.

The “*bag of waters*” is a sac of membranes in which the child is enclosed. Within this bag is found a liquid in which the child floats. The presence of this liquid between the child and the walls of the womb serves to protect it from the effects of falls or blows to which the mother may be subjected, and favors the regular devel-

opment of the child. When labor begins with the stretching of the mouth of the womb, a small portion of this sac is pushed out like a wedge beyond the rim of the dilating orifice, and thus helps in the dilatation. When the waters break early, labor is much more tedious because the even pressure of the bag of waters on the mouth of the womb is lost, and the stretching cannot, therefore, go on so rapidly and easily. As the mouth of the womb opens, the pouch formed by the bag of waters is pushed further and further out into the vagina, the pains become stronger, and the pouch at last bursts, letting the water escape. This is "the breaking of the waters," called by physicians the "rupture of the membranes," and it should not take place before the mouth of the womb is fully open.

Labor, however, sometimes begins with this loss of water, as has been said in the chapter on the Accidents of Pregnancy.

The pains of the first stage of labor are cutting, grinding pains, very hard for the patient to bear, and causing her to be nervous and irritable.

The *cries* made by the patient during the first stage of labor are very different from those of the second stage. They are cries of complaint and suffering, while during the second stage they are rather groans accompanying a bearing-down effort on the part of the patient. The pains of the second stage are called "forcing" or "bearing-down pains." An experienced woman will know, as soon as these pains begin, that the doctor should be

on hand as soon as possible; and she should send him a message which will lead him to realize the necessity for coming at once.

The pains during the second stage increase in strength and frequency; the patient holds her breath and bears down forcibly with each pain. The effort causes her to become flushed and heated, and to break out into perspiration.

During this time the head of the child is forced down the middle passage, or vagina, to the external opening. At the end of each pain the head goes back a little, so that the birth-track may be very gradually stretched. With women who have previously born children there is often so much relaxation of the tissues forming this passage-way that the head of the child may be expelled by a single pain. This sudden birth of the head often causes very serious tears.

After the external opening has been sufficiently stretched by the slow advance of the head, it gradually works out altogether, and then the worst pain is over. There is then a short interval of rest before the remainder of the body is born, the shoulders coming first by a strong pain, after which the lower part of the body easily slips out.

The contraction of the womb, or "pains," now ceases altogether from five to twenty minutes or even half an hour, when there is again a little pain and the afterbirth comes.

The above description is an account of what labor

should be if perfectly natural. There are many emergencies which may arise in any case, hence, for the sake of the patient and nurse, every effort should be made, even in what promises to be a normal case, to have the doctor on hand in time.

CHAPTER XI.

DUTIES OF THE NURSE DURING LABOR.

With the occurrence of the symptoms which indicate the onset of labor the nurse, if not already in the house, should be immediately summoned.

A nurse should give very prompt attention to such a call, and lose no time in getting to the patient, as many women pass through the different stages of labor very rapidly.

On arriving at the patient's house, the nurse should put on her *working clothes*, which should always be scrupulously clean and of wash material. The uniform worn by the nurses of the Woman's Hospital of Philadelphia consists of a blue and white striped seersucker dress, very plainly made; a large, plain white apron, with bib, well protecting the dress; over-sleeves, of same material as apron, for the protection of the dress-sleeves, and a white muslin Normandy cap. This makes a plain yet attractive dress—which is a matter of considerable importance to the patient, who gets her first impressions of her nurse through her personal appearance.

Woolen dresses, or those made of any material which will not bear frequent washing, should never be worn by a nurse. There is always the possibility—in fact, the

probability—of such a dress having been worn during her attendance upon some previous case of illness, in which case it would greatly endanger the patient. The feeling of the wash dress as it comes in contact with the patient's skin, when the nurse lifts her or works around her, is much more agreeable than that of woolen stuffs. Then, too, it is more business-like, looks more like work, and gives the patient the comfortable feeling that a nurse means to help her, rather than to sit around as a fine lady, attending simply to the daintier duties of attendance upon the sick. I introduce this subject here because I find that many graduate nurses, in breaking their direct connection with their training schools, set aside as a matter of small moment this requirement concerning dress—a requirement in which a most important principle is embodied and which demands the hearty support of every truly scientific nurse.

Another important point I wish to mention here, and that is that a nurse should learn to dress herself quickly, so that she can slip into the necessary garments in a very few minutes, and thus, by her promptness in reporting for duty, awaken the confidence so essential to her management of patients.

On entering the room where the patient is to be found, while exchanging the necessary greetings, the nurse should exercise her powers of observation and rapidly take in the state of affairs, forming her opinion as to how far the labor has progressed. Should "pains" be occurring, she will recognize from what has been said in a

preceding chapter of the pains characterizing the different stages of labor, whether the patient is really in labor or not, also how much time is probably left for the making of preparations. She can learn from the patient, in the intervals of her suffering, when the pains first began, how often they occur, whether the waters have broken, etc., so that she may know what message to send the doctor, should the necessity exist for so doing. After this duty has been performed, if labor has really begun, the nurse should give herself to the *preparation of the patient* and the *room* for the confinement.

Preparation of the Patient.—The nurse should inquire of the patient whether her bowels have been freely moved recently. If not, a simple *enema* of soap and water may be given for the purpose of clearing out the lower bowel and making the second stage of labor easier and cleaner.

Inquiry should be made as to whether the patient has *passed water freely*. If not, she should be urged to make the attempt, and, if not successful, the physician should be notified.

It is desirable, if there is time, to have the patient take a *full warm bath* and put on entirely fresh clothing. The external genitalia should be washed off with a solution of bichlorid of mercury 1-2000 or 1-4000; or some other antiseptic solution may be employed according to the choice of the physician.

Preparation of Antiseptic Solutions.—Tablets of bichlorid of mercury may be obtained at any apothecary.

cary's, one of which, if added to a pint of water, will give, as a rule, a solution of 1-1000, from which solutions of varying strength may be made up by the addition of more or less water. Thus, on adding seven parts of water to one part of the bichlorid solution 1-1000, a solution of 1-8000 may be obtained. It is always desirable that the nurse should have a little porcelain or agate-ware measure, by which she can readily and quickly prepare these solutions. If tablets cannot be obtained, powders of $7\frac{1}{2}$ grs. each of bichlorid of mercury, if added to a pint of water, will give a solution of 1-1000.

Creolin, a coal-tar preparation, four times stronger in its antiseptic properties than carbolic acid or lysol, may be used in place of bichlorid of mercury. To make these solutions, $\frac{1}{2}$ to 1 dram of the liquid preparation should be added to the pint of water. Creolin and lysol, though not so strongly antiseptic as bichlorid of mercury, have greatly come into favor of late, both because they do not have the same corroding effect on instruments which may be used, and because there is less liability of poisoning than in the use of bichlorid of mercury. An objection has been raised to their use for vaginal injections, as it is claimed that their admixture with blood produces a tarry precipitate. The coagulation of albumin in vaginal discharges, by the action of corrosive sublimate, is similarly claimed to deteriorate the value of the latter as an antiseptic agent. In cases where there is excessive discharge it may be better, therefore, to

substitute a solution of permanganate of potassium, or carbolic acid.

A nurse should never lose sight of the fact that the corrosive sublimate (bichlorid of mercury) tablets are a deadly poison, hence there should be no neglect as to care in their handling.

Carbolic acid solutions are preferably used by some physicians. A two per cent. solution of the latter may be made up by adding 2 $1/2$ drams to the pint of water.

When the patient seems to be in *active labor*, the nurse should keep her lying down until after the physician has made an examination. He will then state whether the patient may sit up or walk about the room.

Because of her long confinement to bed the *hair* of the patient should be arranged so that it will be most comfortable and not readily tangled. The best arrangement is that of parting the hair down the back of the head and braiding it into two plaits—one behind each ear. This leaves a smooth surface at the back of the head to lie upon.

The *outfit* of the patient during the labor should consist of a merino vest, long night-dress, a pair of large, roomy, open drawers, and a pair of stockings. While walking about the room, and until the second stage of labor begins, she may wear a wrapper over the rest of her clothing and have on a pair of bedroom slippers, which can be easily slipped off when she needs to lie down.

The patient should be told by the nurse of the neces-

sity for an *examination* by the physician, particularly if this is her first labor. When the physician comes, the patient should be placed on the bed, near its edge, lying on her back or side, as he may prefer, with her limbs drawn up toward the abdomen. Her clothing should be lifted above the hips, and a sheet, or some light covering, used to protect the lower part of the body from exposure. Cleanse the vulva with green soap mixture and water, followed by bichlorid mixture 1-10,000 and sterile water. A chair should be placed for the physician on the same side of the bed, close to its edge, facing the patient as she lies; a jar of sterile vaselin should be brought him, and all the necessary materials provided for the proper cleansing of his hands both before and after the examination; soap, nail-brush, warm water and towels, and some disinfectant solution, as a bichlorid of mercury solution of the strength 1-2000, or creolin, a dram to a pint of water, or lysol in the same proportion. Also a pair of sterile rubber gloves.

The preparation of the room and bed will next require the nurse's attention.

These preparations should be made as quietly as possible. The nurse should have learned beforehand where things are, and she should have had them so arranged that but little will need to be done at the time, except to put them where they will be most convenient for use. It is well, if the patient is walking about, to have her go into the next room while the bed is made up.

A *single bed* is always the most convenient in the management of a patient, but such are rarely found in private houses. The preparation of a single bed would be as follows: First, the mattress—preferably of hair—covered by a pad and rubber-protective across the middle of the bed, or covering the bed entire. (Rubber army-blankets are used in the Woman's Hospital for this purpose.) The under sheet covers this rubber, and a draw-sheet—a sheet folded four times in its length and placed across the portion of the bed upon which the hips would rest—comes next. (The folded side of the draw-sheet should be toward the head of the bed.) This constitutes the first dressing, or what is known as the "*permanent bed*." The different articles constituting this dressing are securely fastened down by safety-pins. Over the "*permanent bed*" comes the "*temporary bed*," consisting of a second gum blanket, covering the entire bed, a second under-sheet and draw-sheet. Covering these are the upper sheet, blanket, and spread.

After the confinement, the "*temporary bed*" can be drawn from under the patient, leaving her lying on the "*permanent bed*." The change is accomplished with much greater ease for both patient and nurse than the changing of the various articles separately.

The *double bed* found in most private houses is arranged as follows: First, the ordinary dressing of the bed, the hair-mattress, pad, rubber-protective, under-sheet, and draw-sheet. Upon top of this dressing, at the

lower right-hand corner of the bed, a "temporary dressing" should be arranged, about a yard and a half square, consisting of a rubber protective, or the paper pad before described, securely fastened down to the bed beneath, and covered, if rubber, simply by a folded sheet, likewise fastened down by safety-pins. If the paper pad is used, an old comfortable or blanket will be needed beneath the sheet. The pillow for the patient should be placed at the upper and inner corner of this square. After the delivery, she can be lifted to the upper part of the bed, and the "temporary dressing" removed.

The sheet, blanket, and spread which are to serve as her covering after the delivery may be kept from soiling during the labor if folded upon themselves several times and carried to the extreme edge of the left side of the bed. Another sheet and blanket may be used as temporary covering during the delivery. It is so important that a patient shall be moved as little as possible immediately after the labor, because of the tendency to bleeding produced by motion, that the nurse should study carefully the best methods of protecting patient and bed from soiling, so that it will be necessary to do but little in the way of changing the clothing.

The piece of *floor oil-cloth* must be spread at the side of the bed, extending from a foot to a foot and a half under the bed.

There should be a *bureau* with a set of drawers, or a closet, with shelves, in the room, given up to the nurse for the keeping of the various articles she may need, and

these articles should be conveniently arranged so that there may be no confusion in obtaining them when required at any time. One drawer or shelf should contain sheets; another towels and napkins and soft, clean muslin or linen rags, to be used as napkins during the delivery; a third should contain changes of underwear for the patient, and a fourth the baby's wardrobe.

A *change of clothing* for the mother should be placed—if it is warm weather—in the sun by a window; if in winter, by the register or stove, so as to be dry and warm should it be needed.

The *baby's suit* should in the same way be aired and warmed. The *baby's basket* should be placed on a chair or stand near the register, with all the necessary articles for its toilet and bath—a *baby's bath-tub* or an ordinary foot-tub, soft towels, nurse's flannel bathing-apron, a little sterilized cosmolin in a jar, etc. Two pieces of bobbin, each eight inches in length, should be put in a little vessel containing some bichlorid solution, 1-4000. These, with a pair of blunt scissors, should be placed where they can be conveniently reached for the tying of the cord. Some small squares of soft muslin or linen should be placed where they will be convenient for the immediate cleansing of the child's eyes after expulsion of the head. A flannel blanket or good warm flannel petticoat should be provided for receiving the child upon its birth. The baby's *crib* should also be prepared for its reception.

Beneath the bed there should be *two chambers*—one

for urine and one for the after birth, or a tin *basin* may be provided for the latter.

A *vessel for the patient to vomit in* should be on hand—a chamber, or even a chamber-lid, will do very well.

A *basin filled with warm solution of bichlorid of mercury*, 1-4000 or 1-2000, should stand near the bed, or, if preferred, the creolin or lysol solution, so that the nurse or physician may repeatedly cleanse the external organs of generation of all discharges during the progress of the labor. The solution in this basin should be frequently changed.

A sufficient number of soft linen or *muslin rags* will also be necessary for this purpose.

Agate, porcelain, or china basins are necessary when bichlorid solutions are used. For creolin or lysol ordinary tin basins will do.

The nurse should never allow anything from the kitchen to be pressed into service for such an occasion. The indiscriminate use of pans, basins, cups, and saucers is certainly vulgar, to say the least. The “eternal fitness of things” should never be lost sight of.

A *urinal*, or a soap-cup, which is a good substitute; a *glass catheter*, and an *English rubber catheter*, No. 8 or No. 9; a *bed-pan*, and the other receptacles for the various purposes above referred to, may be placed for convenience beneath the bed.

A *towel-rack* near by should contain at least half a dozen fresh towels.

A few *napkins*, a supply of *soft rags*, a *waste-bucket* or

slop-jar, with a lid, should be found in the room; and an *abundant supply of hot and cold water*.

As soon as the patient is known to be in labor, the nurse should go to the kitchen to see that the fire is good and that plenty of water is put on to boil. An arrangement should also be made by which some member of the family will be prepared to respond to the nurse's call for more hot water when it is required. The *abdominal bandages* for the patient, with the towel containing the sterilized *dressings* and a *pin-cushion* containing safety-pins, should be placed on the stand beside the bed.

A *bottle of whisky* or *brandy*, and one of *hartshorn* should be provided.

A pitcher of cool water and a tumbler should be found in the room, as the patient may need a refreshing drink during the progress of the labor. A feeder is best provided for the patient's use, as she can then drink lying down.

The *arrangement of the patient's clothes* to keep them from soiling during the expulsive stage of labor will require some care on the part of the nurse. The night-dress or vest should be folded or rolled up beneath the arm-pits and fastened with safety-pins over the right side of the chest. If the patient wears large drawers, no further protection than the cover-sheet may be necessary. Some prefer having a sheet adjusted around the waist, above the abdomen, and pinned under the clothing to the right side, the long end of the sheet which remains, and which should be the anterior part, is

plaited up and fastened also beneath the right arm by means of safety-pins. The sheet thus resembles a skirt opened at the right side.

During the Early Stage of Labor the nurse will need to encourage the patient, and by a sensible, quiet, yet cheerful bearing keep her strong. It is of no use for patients to hold their breath and bear down during each pain in this stage, and nurses should never urge their patients to do so. It should be left to the physician to decide when bearing-down efforts are desirable. The pressure of the nurse's hand upon the back during a pain often gives great relief to the patient, while the occasional bathing of the face and hands with cold water is refreshing. Frequent sips of cold water may be permitted.

Nourishment in form of beef-tea, gruel, milk, and tea may be given from time to time if the labor be long. No stimulants should be given without the direction of the physician.

Vomiting is a troublesome though not necessarily a dangerous symptom during delivery. In fact, the relaxation it produces is often desirable. If it is excessive, however, a little iced soda water may check it.

Cramps in the lower limbs are a very frequent accompaniment of the second stage of labor. Relief may be obtained by stretching the limb straight out, gently rubbing the painful muscles, or grasping and holding them.

Friends and Neighbors should, if possible, be expelled from a confinement room. Their injudicious tales and

expressions of sympathy are often absolutely painful. The nurse has to manage this with great tact. She can generally succeed best by stating to the friends that it is the physician's wish she should do so, and her relations toward the physician require that she should implicitly observe his directions. If the nurse does not allow herself to become familiar with her patients, but maintains a quiet dignity in the carrying out of her directions, her requests will generally be observed.

Tact is a magic wand by which human beings can accomplish miracles in the way of subduing the obstinate. Happy is the nurse who possesses it! The best rule for acquiring it is the Golden Rule, "Do unto others as you would that they should do to you." A strict observance of this will insure a kindness of tone and manner in the making of requests which will win consent when it would not otherwise be granted.

Duties of Nurse.—One of the most important duties of the nurse during the confinement is the frequent changing of napkins, draw-sheets, towels, etc., used about the patient. Also the frequent renewal of the antiseptic solutions to be used for her, or for the doctor's hands.

Antisepsis means, literally, "against poisoning," and implies the careful removal of all sources of poisoning, such as would come from decomposing blood and discharges or dirty articles. The physician's and nurse's hands, therefore, require a special preparation for the labor in their thorough disinfection. During the course

of the labor the hands should be thoroughly cleansed with a bichlorid solution whenever they have touched anything unclean, or whenever they come in contact with the genital organs.

Position for Delivery.—The patient may be delivered on her back or lying on her left side. When the physician desires the change of position, the nurse must help the patient to turn on her side and bring her hips close down to the edge of the bed. The upper or right limb will then have to be supported by the nurse, in order to well separate the thighs until the delivery is effected. (When there is insufficient help, a pillow may be used between the knees.) She will have to get on the bed close to the patient for this, and hold the leg at knee and ankle. After the child has come, she should help to turn the patient in the bed, bring a flannel wrap to put the baby in as it lies on the bed before the tying of the cord, and throw a covering over the mother's chest. She should then wipe the baby's eyes with a fine, soft piece of linen dipped in tepid water, or a saturated solution of boric acid; should bring the doctor the scissors and bobbin, and have ready a sheet for receiving the child and a vessel for the afterbirth. She should hold the sheet doubled upon her outstretched arms, the side toward her being held up by her chin. On receiving the baby with its flannel covering, she allows the edge of the sheet held up by her chin to drop down over the child. She then folds over the hanging ends, so as thoroughly to cover the child, and places the little bun-

dle in a crib to await further attentions, until the mother has been made comfortable. Should the child breathe imperfectly, the physician will give it his own attention or direct the nurse what to do.

Disposal of Afterbirth.—The vessel containing the afterbirth, if the latter has been detached from the child, may be placed temporarily under the bed, to await the physician's examination. If the cord has not yet been tied, the vessel may be put in the crib with the baby. Many physicians do not tie the cord or navel-string until there is no further pulsation in the vessels.

Attentions after Labor.—Should the physician not desire to do so, the nurse should next attend to the *cleansing* of the mother's external parts by means of soft cloths dipped in a solution of bichlorid of mercury 1-4000, or whatever solution the doctor may direct.

Many physicians make a practice of using a *vaginal injection* of some disinfectant solution immediately after delivery. It will be the nurse's duty to prepare this should it be called for. The "temporary dressing" should be removed from the patient, and she should be gently lifted on to the upper portion of the bed. The binder and dressings must next be applied.

The *binder* must be rolled up to half its length, and the rolled portion passed beneath the patient's back. It is then caught on the other side and unrolled, straightened so as to be free from wrinkles, and made to encircle the hips tightly. The overlapping ends are then fastened together by means of safety-pins down the

front. The middle portion of the bandage should be tightened first, as the firmest pressure should be directly over the upper portion of the womb. The lower portion of the bandage is fastened next, and the pins in the upper portion placed last, as this does not need to be so firmly applied.

The *antiseptic dressings* should next be applied in the order described in the preceding chapter. The napkin is spread out and fastened to the abdominal bandage anteriorly, so as to fit over the convexity of the upper portion of the external organs of generation and extend from groin to groin. Posteriorly it is fastened to the abdominal bandage by but one safety-pin. This makes an "occlusion dressing."

The patient's body-clothing should then be unfastened and drawn down (her drawers and stockings should have been removed with the "temporary dressing"). The coverings of the bed are drawn up over her, and she is allowed to lie quietly until the nurse cleans up the room and makes preparations for washing the baby.

The physician generally remains with the patient an hour after the delivery, taking her temperature and pulse, and watching the condition of the womb, to insure against danger of hemorrhage from want of proper contractions.

After the doctor leaves, this duty devolves upon the nurse, who should examine the dressings frequently to see that the bleeding is not too profuse, and place her hand over the lower part of the abdomen to feel the

womb, which, if properly contracted, should be a round, hard body about the size of a child's head, immediately above the pubic bone, and not reaching higher than the navel. The consideration of the accidents of labor and the care of the infant will be treated in other chapters.

CHAPTER XII.

ACCIDENTS AND EMERGENCIES OF LABOR.

Women who have borne children before are apt to have *rapid labors*, hence a nurse should be on her guard when in attendance upon such a patient, watching for the symptoms of approaching labor, and notifying the physician earlier than she would feel warranted in doing with a patient expecting her first confinement. As soon as the nurse suspects that labor pains have begun, she should put her patient to bed. When "bearing-down" pains begin, the patient should not get up even to use the chamber. A bed-pan should be used. The patient should not be allowed, when the pains come on, to catch hold of anything to increase the force of her effort. Above all, the nurse should not *tell* her to bear down.

The strength of the pains is somewhat modified if the *patient is kept on her side*. This position is also safer for the perineum, which does not so directly get the full force of a pain as when the patient lies on her back. The left side is preferable, as it enables the nurse to use her right hand to greater advantage.

Should the child's head come down so that it can be seen at the entrance to the vagina, the nurse should place herself on the right side of the bed, and as the patient lies on her left side, with the hips well drawn to the edge

of the bed, the nurse should gently *hold back the baby's head* during a pain. This is to prevent a tear from occurring by the sudden expulsion of the head. She should favor the gradual stretching of the parts. She should avoid interfering in any way, as in making efforts to enlarge the opening by stretching it with the fingers, etc. All such attempts will inevitably result in harm. When the opening is sufficiently stretched, the head will slip out of itself.¹ The passage of the child's head is rendered easier if the patient's knees are separated by a pillow. The nurse should simply continue to support the head with her hand, and as soon as the head is born her left hand should be placed over the mother's abdomen, resting upon the womb, which may be distinctly felt through the abdominal walls. The *pressure of the hand* acts as a stimulant to the womb, and *induces good contractions*. A tendency to hemorrhage is thus averted. The right hand of the nurse should support the child's head. With one finger she should *feel around the baby's neck* to learn whether it is encircled by a loop of the navel-string or cord. If so, she should *gently pull first on one side and then on the other, of the cord*, to see which end is loose. This relieves the pressure and prevents the stoppage of the circulation in both cord and child's neck.

¹When the approach of the expulsion of the head is indicated by the increasing thinness of the perineum, the *perineum may be supported* by placing the palm of the other hand over the posterior portion of the perineum and pressing it forward toward the pubes. This relieves the edge of the perineum from strain.

When, after a pause, the pains start up again to expel the rest of the child's body, the nurse had better have some one instructed how to hold the womb properly, as both her own hands will be needed to *receive the body of the child* as it is expelled. The mother herself may be shown how to make this pressure over the womb. If there is no one to make this compression of the womb, the nurse should try to manage the baby with one hand and keep up the pressure over the lower part of the abdomen with the other. The flannel wrap for the baby may be put close up to the mother's hips, and the nurse can manage with one hand to lay the baby down on this, cover it up, and draw it far enough away from the mother's hips to keep it out of the discharges. She should *see that the baby's mouth is free from liquids*. The little finger of her right hand acting as a hook, the end of the finger should be passed in at one corner of the baby's mouth and out of the other corner, thus scooping out any liquids that may have been drawn in during the birth. She should be careful to see that the *cord is not dragged upon* and that the *baby breathes well*. Babies usually cry lustily just after the birth. This should be a welcome sound to both nurse and mother, as it ensures expansion of the lungs. Occasionally, a child will be born with what is known as a "*veil*" or "*caul*"—a portion of the membranes drawn tightly over the face. This may cause death from suffocation unless it is quickly seized by the fingers and torn off, so as to free the child's mouth and nose.



FIG. 30.—SUSPENSION OF THE ASPHYXIATED NEWLY BORN CHILD BY THE FEET TO ASSIST GRAVITY IN FREEING THE AIR-PASSAGES OF FOREIGN MATTER. (Edgar.)

Resuscitation of Baby.—If the baby is apparently lifeless when born, besides the measures spoken of for clearing its mouth of liquids, it may be turned over on its face, to empty out the discharges from the air-passages, and efforts should be made to *start breathing*. The *head of the child should be lowered*, to keep as much blood there as possible. Hold the child up by the ankles with its head down to facilitate the escape of liquids from the air passages and rub the child's back briskly up and down the spine with a coarse towel.

The back may be slapped—several short, quick slaps given over the buttocks. A stream of cold water may be poured on the chest just for a moment, and this repeated several times.

If these measures fail, the nurse may *breathe into the baby's mouth*. To do this properly, the baby's nose should be held, the nurse's lips placed closely over the baby's open mouth, as she breathes into it, then the nurse's mouth is re-

moved and the grasp on the nose loosened, the sides of the child's chest being pressed upon to press out the air. The number of breaths given by the nurse in a minute should not at first exceed twelve.

Byrd-Dew Method.—A most valuable method of carrying on artificial respiration, recently revived, is that known as the Byrd-Dew method, the different movements of which are well shown by the accompanying illustration. The operator holds the neck of the child between the thumb and the index finger of one hand, while the other hand holds the child at the nates. The first step (Fig. 32) is to flex the body of the infant along its dorsal surface as much as possible, bending the spine well backward; then gradually to flex it upon its ventral surface, bringing the head in close apposition to the lower extremities (Figs. 33 and 34). In the first movement the diaphragm is pulled down mechanically, as a result of the descent of the abdominal organs. We thus imitate *inspiration*, and during the manipulation may often hear air entering the trachea. As the body of the child is bent forward, the diaphragm

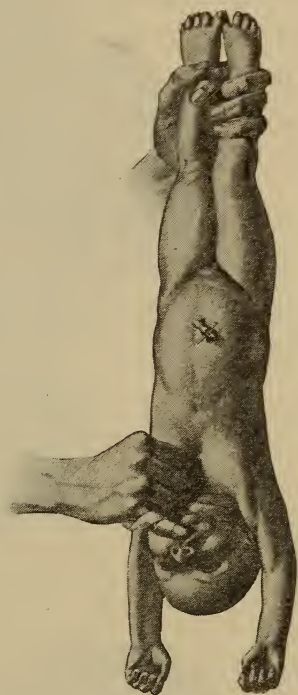


FIG. 31.—SUSPENSION OF THE ASPHYXIATED NEWLY BORN CHILD BY THE FEET, AND CLEANING THE POSTERIOR PHARYNX OF FOREIGN MATTER WITH THE LITTLE FINGER WRAPPED WITH GAUZE. (Edgar.)

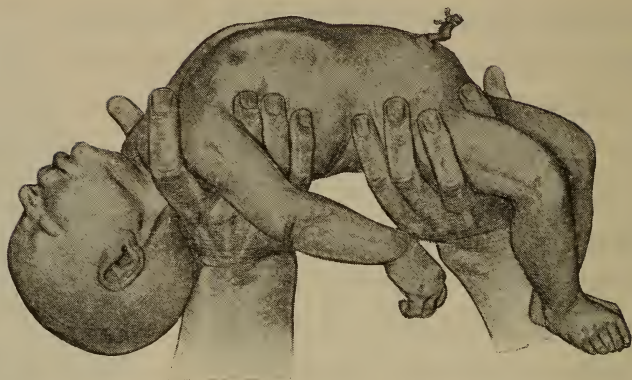


FIG. 32.—BYRD'S METHOD OF ARTIFICIAL RESPIRATION. POSITION FOR INSPIRATION. (*Edgar*).



FIG. 33.—BYRD'S METHOD OF ARTIFICIAL RESPIRATION. POSITION BETWEEN INSPIRATION AND EXPIRATION. (*Edgar*).

is pressed upward and the walls of the chest are compressed. Thus the expiratory act is accomplished; and, during it, not only air is driven out, but the mucus and amniotic liquid that may have entered the air-passages.

These movements may be carried on while the surface of the child is kept beneath hot water the greater



FIG. 34.—BYRD'S METHOD OF ARTIFICIAL RESPIRATION. POSITION FOR EXPIRATION. (*Edgar*).

Note the inversion of the child to assist in freeing the air-passages.

part of the time—which is a decided advantage over some of the other methods of resuscitation, especially in asphyxia of the second degree, when the surface of the child is very pale, showing it to be suffering greatly from shock. It is always important in such cases to keep the body of the child warm. The movements should not be too rapidly performed—about three times to the minute is often enough.

Alternating with artificial respiration, warm baths

may be employed from time to time. The temperature of the bath should be 100° Fahr. Ground mustard may be put in the water. After breathing is established, the



FIG. 35.



FIG. 36.

PROCHOWNICK'S METHOD OF RESUSCITATION.

child should be placed in warm wraps, with bottles of hot water around it.

Method of Prochownick, of Hamburg.—A method of resuscitation that has been employed with great suc-

cess for many years by Prochownick, of Hamburg, in the severer grades of fetal asphyxia, is carried out as follows: As soon as delivered, the child is seized by its feet, as shown in Fig. 35; the child's forehead is allowed to rest lightly on a table or some other surface, the face being extended, so that the chin is thrown well forward and the trachea, or windpipe, freed from all compression. The mouth in this position hangs open. While an assistant holds the child in this position, the operator grasps the chest with both hands (see Fig. 35), and makes compression over it, thus imitating the act of *expiration*, by which discharges drawn into the air-passages may be expelled. A relaxation of this compression permits expansion of the chest, and thus *inspiration* is effected. These movements are carried on rhythmically until natural breathing is established. When an assistant can not be had, the manœuvre can be carried on as shown in Fig. 36, by means of one hand, although less efficiently.

Laborde's Method.—Still another new method of resuscitating an infant has been employed of late in France. The tip of the tongue being seized by means of a towel and held between the fingers, or by means of the ordinary tongue forceps, the organ is drawn well forward and then pushed backward. Rhythmical movements of the tongue are thus kept up until respiration is established.¹

¹The Marshall Hall and Sylvester methods of resuscitation are more efficacious when employed for adults than in the case of infants, hence have not been considered in this connection.

Relapses after resuscitation are very common—hence a child will need to be watched very closely after such measures have been employed, until sufficient time has elapsed to fully persuade both doctor and nurse that the action of the respiratory apparatus is normal. For at least twenty-four to forty-eight hours a resuscitated child should have a special attendant, whose business it will be to watch it. If not doing well such care may be needed for a longer period.

Tying of the Cord.—If all is well with the child, it is best not to tie the cord until all pulsation ceases in it. This measure is thought to save the child some loss of blood. As the pulsation may last for an hour or more after the delivery, the afterbirth is generally expelled before the cord is tied. To tie the cord, two pieces of bobbin, each eight inches long, dipped in a bichlorid solution (1-4000) or in some other antiseptic solution, or dry sterilized, should be used. The first ligature should be placed two finger breadths from the child's abdomen. The string should be carried underneath the cord. In making the first tie, two twists instead of one should be taken to keep it from slipping. If the thumbs are placed upon the string in tying, the ligature can be drawn more tightly, and the grasp of the ends of the bobbin is more secure. The second knot is tied the same way. The ends may then be looped, making a bow-knot. The cord should be stripped, that is, the blood remaining in the vessels squeezed out toward the afterbirth, before each ligature is thrown around it.

The second ligature is one inch further away from the insertion of the cord into the child's abdomen. After this second ligature is tightened, hold the cord with the forefinger and middle finger at the ligature nearest the child, the thumb and other fingers at the other ligature, and cut it with a pair of dull scissors between these points. The extremities of the scissors are thus made to look toward the palm of the hand, and a sudden movement on the part of the child does not result in the same danger to it as there would be were the points not thus protected. After the cord is cut, squeeze the remaining blood out from the end next the child. The scissors for this purpose are preferably dull, as the more ragged wound thus produced favors the closure of the blood-vessels. This lesson may be learned from nature, the lower animals gnawing off the cord after giving birth to their young, and thus no doubt decreasing the danger of bleeding. As soon as the cord is cut, a sterile dressing should be applied consisting of a small gauze sponge with a hole cut in its center through which the cord is slipped, and a sterile binder made of a strip of gauze eighteen inches long by eight inches wide, folded in four lengthwise, this is wrapped around the abdomen snugly covering the cord and the gauze sponge.

Position for Delivery of Afterbirth.—The best position for the mother during the delivery of the afterbirth is on her back, hence she may be turned after the nurse has satisfied herself that the baby is in good condition.

Twins.—Very occasionally, on placing her hand over

the abdomen, after the delivery of the child, the nurse may feel another child there. In this case she must simply keep the womb well contracted by rubbing it gently through the abdominal walls, and wait for nature to go on with the work of expulsion. This baby must be cared for as the other.

The afterbirth generally comes away within twenty minutes after the child's birth. Two or three pains occur, during which the nurse should keep the womb in the middle line of the abdomen and make gentle pressure backward and downward. With her right hand she should seize the afterbirth and membranes and twist them around several times to make a cord of the membranes, so that they may not tear, but all be expelled at once. A discharge of blood and some clots generally follows the delivery of the afterbirth. The nurse's left hand should still be kept carefully over the womb, which should feel hard and firm and should not reach above the navel. If it does not feel firm, rubbing over the lower part of the abdomen should again be resorted to until the round, hard body is felt.

If the afterbirth does not come for an hour, and the physician has not yet come, advise sending for another doctor.¹

After the afterbirth has come, it should be put in a

¹ Sometimes the placenta or afterbirth, is *adherent* and will require to be separated from the uterine wall by the finger. If it is simply *retained* by what is called *hour-glass contraction* of the uterus, the expulsion will occur with the relaxation of the contraction, though an anesthetic may be necessary. Gentle pressure over the uterus is all that is necessary.

clean vessel, and, if detached from the baby, put in an adjoining room for the doctor to examine when he comes. Insist upon his seeing it, to find out whether it is all there. Have the baby removed to its crib and placed on its right side and properly covered.

After-care.—Watch the womb carefully until the doctor comes. If it be firmly contracted, and no more blood be flowing from the vagina, place some dry napkins or a clean sheet under the patient, and wash off the thighs and surrounding parts with warm water containing bichlorid in the strength of 1-4000, and dry with a soft cloth.

Slip the soiled clothing from under the patient, and then apply the binder and dressings, and make her comfortable.

As soon as the doctor comes, report to him the exact time when the waters broke, when the baby was born, and when the afterbirth came. It is always best for a nurse to keep a written report with a statement of what she did. She should not, however, neglect her patient for the purpose of perfecting her report.

Breech Delivery.—Sometimes a nurse has the misfortune to be the only attendant at a breech delivery; that is, instead of the child's head coming first the breech passes out from the birth-canal. Delivery in this manner is very dangerous to the life of the child. The nurse should do absolutely nothing here, as she would only make matters worse in trying to assist. These deliveries are long enough, as a rule, to give ample time for

the summoning of some doctor to take charge of the case. In all breech cases the child is apt to need to be resuscitated, if it is alive at all; hence plenty of warm water, etc., should be ready for the bath.

Hemorrhage.—Flooding from the womb, or “uterine hemorrhage,” is apt to occur either within the first twenty-four to forty-eight hours after the birth, when



FIG. 37.—POSITION OF PATIENT IN HEMORRHAGE AFTER LABOR.

it is called “primary hemorrhage;” or it may occur some days after, when it is “secondary hemorrhage.” The appearance of blood, either a constant oozing or a sudden gush from the vagina, is, of course, the earliest symptom.

A pulse of over 100 in a patient freshly confined should make the nurse exceedingly watchful in this respect, as it betokens a liability to hemorrhage. Should

the flow continue, the patient becomes pale, faint, restless, gasps for breath, and finally dies unless the hemorrhage is checked. A nurse should, of course, have the physician sent for at once, although he may have just left the house, or another doctor should be summoned. In the meantime, her first thought should be of the uterus and its probable condition of relaxation. The bandage, if applied, should be hastily removed, and the hand placed over the lower part of the abdomen. If the womb is not felt, rub vigorously until it contracts and is felt again as a round, hard body. Keep on rubbing and holding. The nurse should never take her hand off the abdomen until the doctor comes. Direct someone else to take the pillows from under the patient's head, have the foot of the bed elevated, to keep the blood in the head and prevent fainting, which induces heart-clot. Have the foot of the bed placed on the seats of chairs. The patient may be fanned, cold water given her to drink, hartshorn to smell. She should not be allowed even to turn in bed or lift her head. If the doctor has left ergot, one teaspoonful of the fluid extract may be given in a tablespoonful of water. The patient should receive this without lifting her head. Plenty of hot water should be on hand, the water in the tea-kettle boiling. If the physician delays his coming and the flow continues, repeated hot-water injections of about 115° – 120° should be given into the vagina.

Convulsions may come on during the labor as during

the pregnancy. Their management would be the same as that suggested for convulsions during pregnancy.

Other accidents, such as *rupture of the uterus*, or the *coming down of an arm or hand*, or the *navel-string* in advance of the usual part to come first, are conditions in which the nurse can do nothing, except to keep the patient as quiet as she can, and meddle as little as possible until the doctor comes, for whom, of course, she must at once send.¹

Deportment.—At no time, in the management of a case, should a nurse express surprise or consternation, nor should her manner indicate that she has such feelings. Like a true soldier, she must bravely and quietly face the most critical situations and meet their demands. She should by her manner give the mother to feel that all life's vicissitudes are best met by a quiet self-control.

Fortunately, deaths during delivery in this enlightened age are few; for the methods of averting accidents at such times have been so thoroughly studied that accidents themselves are very rare.

¹ In prolapse of the cord, or navel string, it is often an advantage to keep the patient in the knee-chest position until she can be seen by a physician. This removes pressure from the cord.

CHAPTER XIII.

OBSTETRIC OPERATIONS.

The preparation of the patient is identical for all minor obstetrical operations and is as follows: The patient lies across the bed or on an operating table in the lithotomy position with her hips resting upon a Kelly pad, her legs supported by stirrups, a leg-holder, or a twisted sheet. The lower abdomen, vulva, perineum and inner surface of the thighs is cleansed with green-soap mixture and sterile water, followed by bichlorid 1-10,000 and finally by sterile water. The vulvar hairs are clipped or shaved and a pair of sterile leglettes is slipped on.

Anesthesia may or may not be used, depending upon the extent of the operation, the sensitiveness of the patient, and the presence of adequate assistance.

Instruments are prepared by boiling in soda for five minutes; needles, scissors and knives, by boiling for two minutes, after which they are kept in alcohol. Tubes of catgut are boiled for one minute and silkworm gut is boiled for five minutes in plain water.

Provide for the operator and assistants basins of hot water, soap, nail-brushes, nail file, a basin of bichlorid solution 1-2000 and one of sterile water, sterile gowns, caps and gloves. Provide plenty of sterile gauze sponges. Place a chair for the operator, a

table for instruments and sponges, and a basin of sterile water for rinsing the hands.

Perineorrhaphy, or repair of the perineum.—This operation may be performed immediately after delivery or upon the fifth day. The following instruments are required:

Three double tenacula.

One dozen hemostats.

Tissue forceps.

Needle holders.

Needles.

Scissors.

Also suture material of silkworm-gut or catgut (plain No. 1, chromicized Nos. 1 and 2).

Trachelorrhaphy, or repair of the cervix, may also be performed immediately after delivery or on the fifth day. The instruments required are:

Weight or Sims speculum.

Right-angled vaginal retractors.

Two volsellum forceps.

Six hemostats.

Long tissue forceps.

Needle-holder.

Needles.

Suture material of catgut (chromicized No. 2).

Artificial Dilatation of the Uterus by the Insertion of Dilating Bags.—Artificial dilatation may be resorted to in the induction of premature labor or in placenta prævia where the bag also serves to arrest hemorrhage.

Instruments required:

Weight or Sims speculum.

Right-angled vaginal retractors.

Volsellum forceps.

Long-curved forceps for grasping bag.

Dilating bags of different shapes and sizes
(Barnes, Champetier de Ribes and
Pomeroy's).

Piston or Davison syringe for filling bag.

Weight for attachment to bag.

As rubber rapidly deteriorates, the nurse must test each bag immediately before use to make sure that it is water-tight. After being inserted, the bag is filled with sterile water by means of the syringe. When fully inflated, the syringe is removed, the stop-cock turned, a weight attached to the bag and hung over the foot of the bed which is elevated.

Insertion of Bossi's Dilator.—This is a powerful instrument used for artificial dilatation of the pregnant uterus.

Instruments required:

Weight speculum.

Vaginal retractors.

Two volsellum forceps.

Bossi's dilator.

Packing the Uterus for Hemorrhage.—Instruments required:

Weight speculum.

Vaginal retractors.

Two volsellum forceps.

Long packing forceps.

Folded packing, $1\frac{1}{2}$ inch wide, in strips 3 yards long.

Forceps Delivery.—Prepare the patient in the usual way; catheterize when under ether. Instruments required:

Obstetrical forceps (plain or axis-traction).

Glass vaginal nozzle.

Glass intrauterine nozzle.

Outfit for perineal repair.

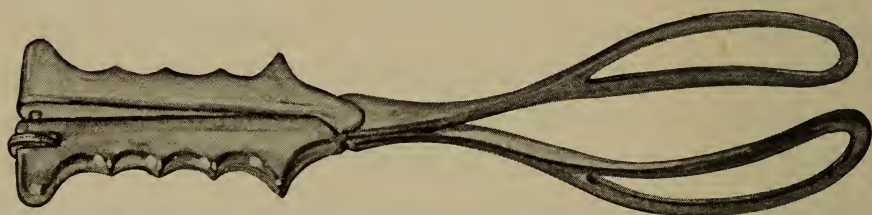


FIG. 38.—ELLIOTT'S MODIFICATION OF SIMPSON'S FORCEPS. (*Edgar.*)

Provide a sterile douche-bag filled with sterile salt solution at 115° for vaginal or intrauterine irrigation, if required. Prepare a tub of hot water to be used for the baby, if it arrives asphyxiated. Be sure to wipe the baby's eyes off with boric acid solution as soon as the head is born.

Version or turning of the child is an operation which requires no instruments. Prepare the patient in the usual manner, have her hips drawn well over the edge of the bed or table and be sure that the bladder is empty.

Manual Extraction of the Breech.—This requires rapid work on the part of the doctor after a certain point in the delivery is reached. The patient's hips must be well over the edge of the table. If the child appears large, forceps should be in readiness and instruments for perineal repair—it may be necessary to apply forceps to the after-coming head.

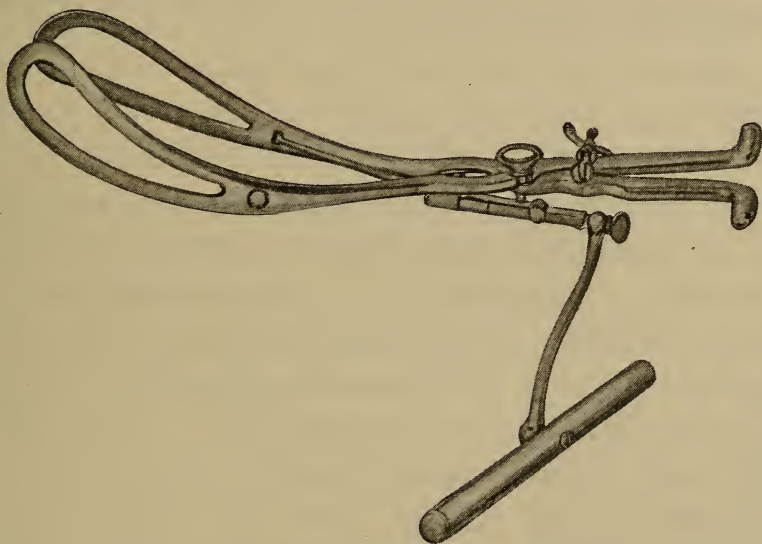


FIG. 39.—TARNIER'S AXIS-TRACTION FORCEPS. (*Edgar.*)

Pubiotomy.—An operation to enlarge the bony pelvis by sawing through the left pubic ramus subcutaneously. This operation is performed when dilatation is complete. After the patient has been put to the test of labor and has demonstrated her inability to force the child's head through the pelvic brim she is prepared for operation as above described with particularly

careful disinfection of the lower abdomen and pubic regions; she must be carefully shaved. Instruments required:

Pubiotomy needle.

Gigli wire saw.

Handles for wire saw.

Axis-traction forceps.

The patient is placed in the lithotomy position and catheterized. The pubiotomy needle is inserted under the ramus of the left pubic bone, passed behind it and brought out close to its upper border. The Gigli saw is threaded in the needle which is withdrawn bringing the saw with it; handles are attached to the saw and, by traction upon these, the bone is rapidly sawn through permitting a separation of 4 to 6 centimeters with safety. Pressure is immediately applied on the subcutaneous incision, forceps are applied to the child's head and extraction proceeded with. After delivery a large pad of sterile gauze is applied over the cut pubic bone and in the vagina while the hips are firmly strapped with broad pieces of adhesive plaster. The cut bone unites firmly by cartilage which usually stretches sufficiently at a subsequent confinement to permit spontaneous delivery.

Classical Cesarean Section.—By this operation, the child is delivered through an incision in the abdominal wall and uterus. It is resorted to when the bony pelvis is so contracted that delivery through it is impossible. when cancer of the cervix or fibroid tumors prevent de-

livery by the vaginal route, and sometimes for placenta prævia.

The preparation of the patient, room, dressings and supplies is the same as for any abdominal operation;

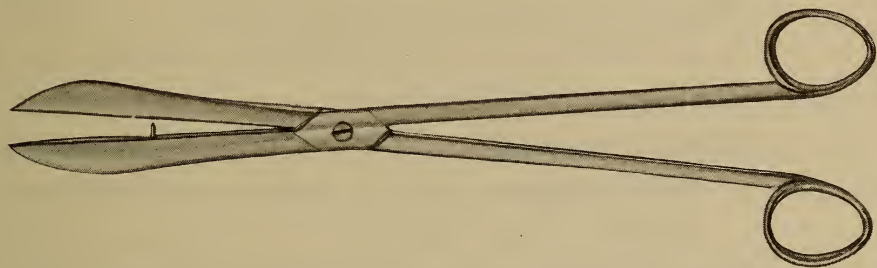


FIG. 40.—SMELLIE'S SCISSORS PERFORATOR. (*Edgar.*)

in addition, everything must be in readiness for resuscitation of the baby. Instruments required:

Two scalpels.

Three pairs scissors; two short, straight, one curved peritoneal.

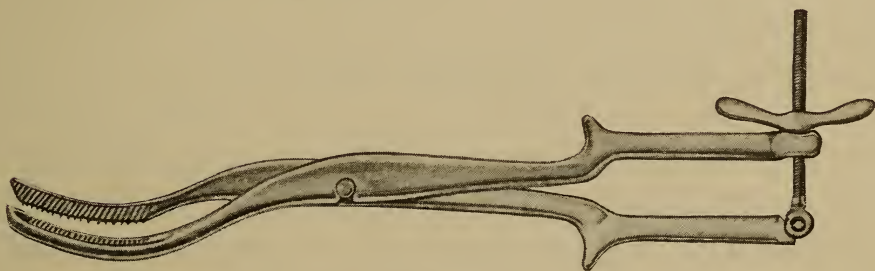


FIG. 41.—BRAUN'S CRANIOCLAST. (*Edgar.*)

Two double tenacula.

Twelve sponge forceps.

Four long straight clamps.

Two long curved clamps.

Two tissue forceps.

Two abdominal retractors.

One uterine packing forceps.

Two needle-holders.

Eight full-curved round needles.

Four full-curved cutting-edge needles.

Two subcuticular needles.

Suture material: Braided silk, Nos. 2 and 3.

Plain catgut, Nos. 1 and 2. Chromicized catgut, Nos. 1 and 2.

Craniotomy.—Perforation of the child's head and extraction of the mutilated head and body by means of the cranioclast is sometimes necessary for the delivery of a large dead child. Instruments required:

Perforator.

Cranioclast.

CHAPTER XIV.

MANAGEMENT OF THE LYING-IN.

Immediately after the delivery it is necessary that the patient should have rest. The room should be *kept exceedingly quiet* and the shades drawn down so as to subdue the light.

The patient may be allowed to sleep, but the nurse, during this time, should watch her very carefully, as there is a liability to bleeding when the sleep is too deep, owing to the general relaxation induced by sleep. She should draw the bedclothes up at one side from time to time, to see how much blood is lost.

There should be no unpleasant *smell* about a confinement room, plenty of fresh air should be allowed to enter, and all discharges should be at once removed from the room.

While the patient sleeps, and after the child has received proper attention, the nurse should place the *soiled sheets, towels, and all articles stained with blood in cold water to soak.*

The *afterbirth*, also, should be disposed of. If in the country, it should be buried in a hole dug in the yard, two or more feet deep. It should never be thrown down a water-closet or privy. In the city it is best to burn it at night. It may be put in the range or stove

and well covered up with coals. Clots of blood may safely go down the water-closet, as they readily dissolve.

To return to the *soiled clothing* left after a confinement—though a trained nurse will not often be called upon to attend to the washing of these articles, there will be times when it would be better that she should do so, both to save the patient expense and trouble and to prevent their lying about too long. At any rate, she should know how it should be done. Should the clothing be put to soak before the blood has dried into it, and allowed to remain for a few hours, the water being changed as often as needed, the washing will not be difficult.

As a rule, it is not best that a nurse should leave her patient or the baby long enough to attend to this wash, hence it is advisable to have it put out or done by some one else in the house. The soaking ought, however, always to be attended to by the nurse, because it facilitates the subsequent washing.

In the after-care of the patient the nurse should attend to the *washing of the mother's and baby's napkins*. She should, if needed, wash the baby's flannels and slips.

Visitors.—For a week a newly-confined patient should see *no visitors*. Even the husband should not remain in the room long at a time. No painful or exciting news should be communicated to the patient, as a distressing form of mental trouble to which lying-in women are prone may be thus induced. This is known as “puerperal mania.”

Food.—After the patient rouses from her first sleep she is generally hungry. The nurse should have learned from the physician before he left what he would prefer her having. A cup of warm milk or tea—not too hot—may be given directly after the confinement when ether has not been taken, and this followed in three or four hours by a light meal, as toast and tea or gruel. With regard to the diet of the lying-in, nurses must be prepared to follow the rules of the physicians for whom they work. Some physicians allow considerable variety in the food from the beginning.

The following directions concerning the diet are given to the nurses of the Woman's Hospital: "It should be remembered, in the diet of the lying-in woman, that the amount of liquids, should the breasts or nipples threaten to give trouble, must be limited, not only until after the secretion of milk, but also until the supply of milk adapts itself to the demand, for the first five or six days after the confinement.

As soon as the patient is made comfortable after the birth, she should have a cup of warm milk or weak tea, or warm water and milk.

First meal-time: Plate of milk toast or bowl of oatmeal gruel, or saucer of wheat germ or boiled rice.

Second meal: Cup of weak tea or warm milk, dry toast, or milk toast, or water toast, or soda crackers soaked in hot milk.

Third meal: Saucer of oatmeal mush or wheaten

grits, with a cup of tea or warm milk, with Graham biscuit or dry toast. In normal cases a little stewed fruit may be given with the evening meal, even on the first day.

Forenoon, afternoon, bedtime: Lunch, a cup of warm milk, with a piece of dried bread or Zwieback.

Second Day.—The same as above.

Third Day.—The same, with the addition of stewed apples or baked apples for supper, if not given before.

Fourth Day.—Breakfast: Soft-boiled egg, dried bread, stewed fruit, and cup of milk or weak tea.

Dinner: Plain beef or mutton-broth, dried bread, and farina or junket.

Supper: Baked apples or stewed prunes, saucer of wheat germ, and Zwieback.

Fifth Day.—Breakfast: Cup of weak coffee or cocoa, mutton-chop, oatmeal mush, dried bread, and a sweet orange or ripe apple.

Dinner: Beef or mutton-broth or oyster-stew, baked potato, stewed tomatoes, dried bread, farina, junket, or rice.

Supper: Stewed fruit, Indian-meal mush, and Zwieback.

Sixth Day.—Ordinary plain diet, avoiding salads, sour fruit, fried or highly-seasoned meats, fancy desserts, or sweets of any kind.

This holds good of all subsequent meals. The above dietary will require to be modified when special indications arise. Should the patient's temperature rise to

100° Fahr., or above, she should be kept on liquid diet, as milk and beef-tea alternately every two hours until the physician directs otherwise.

As liquids favor the secretion of milk, liquid food should constitute a large proportion of the nourishment taken by nursing women throughout the lying-in, provided there is not a tendency to over-secretion. The diet should be plentiful and nutritious, but selected carefully with reference to its digestibility. As the patient must remain inactive for some time, it will not do for her to eat the starchy vegetables, pastry, or warm breads, for all these require very active powers of digestion.

A nurse should thoroughly understand the art of cooking, and be able to provide her patient with palatable and nutritious dishes, daintily and prettily served on a tray, until, with the physician's consent, she takes her place at the family table. Even then a nursing woman will need to receive some nourishment, as gruel, beef-tea, milk, etc., between the regular meals, for she must not only provide for herself, but for her child.

Duration of Lying-in.—The lying-in lasts six weeks. During this time the organs of generation are returning so far as possible to their former condition. It is important that the patient should have rest, and for at least two weeks of this time should be in bed.

Involution.—The process of changes by which the womb shrinks to its normal size is known as "*involution*." This process is favored by the patient lying as

much as possible on her back, so that the womb does not incline too much to one side or the other. The patient may be carefully propped up a little by pillows on the third or fourth day, so that she shall be in a semi-reclining position. This facilitates the drainage of the uterus. Care must be taken not to permit her to move herself too much, as a hemorrhage may be thus started. The progress of involution is determined by the height of the uterus as appreciated by palpation over the lower part of the abdomen. Under the most favorable conditions the uterine fundus will be found to correspond in height with the following points:

Twenty-four hours after labor,—on a level with the umbilicus.

Second and third day,—midway between umbilicus and symphysis pubis.

Fifth and sixth day,—three fingers' breadth above the pubic symphysis.

Ninth and tenth day,—on a level with the pubic symphysis.

A full bladder or a full rectum will prevent proper contraction and decrease in size of the uterus, as also will subinvolution from former uterine disease of any kind, or from inefficiency of the uterine muscular tissue.

The Lochia.—The discharges of the mother continue about two weeks, and they are called the "*lochia*." For the first twenty-four hours they are blood; the second and third day, watery blood; from the fourth to the sixth day they have a greenish-yellow coloration,

and from the tenth to the twelfth day they become white. This white discharge may continue for a long time after the confinement. The character of the discharge will indicate the process of involution, hence the physician should see daily the napkins or dressings removed from the patient. Soiled napkins and dressings should never be kept in the patient's room, but in some closed vessel, as a clean chamber or a slop jar, with a close-fitting lid, in another room. The existence of the least odor about the discharge should at once be brought to the physician's attention. If *napkins* are used, they will need to be changed during the first day about *every two hours*, sometimes oftener; the second and third day, about every three hours: the fourth and fifth day, every four hours; until, by the tenth day, about three changes are sufficient. The antiseptic dressings are changed, as a rule, every three hours until the discharge ceases. If it be very scant, a change once in six hours may be sufficient. These *antiseptic dressings should be burned*. The napkins should be soaked in cold water until the blood is well out of them, and then thoroughly washed and boiled. The boiling is sufficient, if properly done, to render them aseptic, but, as an additional precaution, they may be wrung out in a 1-2000 bichloroid solution before drying. *The patient should be washed off each time the napkin is changed with a warm antiseptic solution*, as 1-4000 of the bichlorid of mercury, or a lysol solution of 1 per cent. Care should be taken not to irritate the parts. Instead of using

a soft cloth to wash off the parts, the water may be poured in a small stream over them, and a soft, dry cloth pressed gently over them to remove all moisture. Especial care should be taken where there are stitches not to pull them in any way.

Bathing.—One daily washing of the entire body is, as a rule, desirable. The doctor's advice, however, should be asked concerning the matter. This wash, when given as a sponge-bath, need not exhaust the patient, nor cause too much movement of her body.

The patient should never feel chilly during this bath; should she do so, the bath must at once be stopped.

The bath should, of course, be given under cover. The increased activity of the skin necessitates especial cleanliness, and the daily bath is found, when properly given, to be very refreshing. Frequent changes of bed and body clothing, too, are necessary—the body clothing, if possible, daily until the discharges cease.

Attention to Bladder.—The bladder is frequently paralyzed after confinement, as a result of the pressure to which it has been subjected during labor. When it is filled beyond a certain limit, it may respond to the irritation and a little urine be voided, but the bladder not be emptied. The nurse can tell by the amount passed whether the patient has probably emptied the bladder or not. The secretion of urine early in the lying-in is very free, hence the quantity passed should never be scant.

By placing the hand over the lower part of the abdomen, the bladder may be felt as a soft tumor on one or the other side, above the pubic bone, the womb being felt as a harder mass pushed to the opposite side.

The *catheter* should not be used without the physician's sanction, but a nurse should never forget to ask very particularly about this matter before he leaves the house after the delivery. It is generally undesirable to allow a patient to go longer than six hours without freely emptying the bladder. As over-distention of the bladder prevents proper contractions of the womb, and as a relaxed womb is a frequent cause of after-pains, it is best to have the bladder quite frequently emptied during the first twenty-four hours. Hence, if the catheter is permitted to be employed, it may be well to use it about three hours after delivery for the first time (the physician having used it, if necessary, immediately after delivery). Its subsequent use should be limited to about once in six hours, unless its more frequent use is demanded by the interference with the contractions of the womb caused by over-distention of the bladder. The patient should be encouraged to make a trial to urinate as soon as possible, so that the use of the catheter may be entirely dispensed with. Great care is necessary in the use of the catheter: 1st, to see that the instrument is thoroughly clean and kept clean; 2d, to see that none of the vaginal discharges are carried into the bladder during its introduction; 3d,

to do no injury to the mother's parts or give her needless pain.

The instrument, a glass catheter, should be thoroughly boiled if there is any doubt about its being aseptic.

When withdrawing it the outer extremity should be kept lowered, so that all the urine remaining may flow out from it, and no sediment settle in the closed end to become a source of contamination at some future time. It should then be thoroughly washed in hot water, which should be allowed to flow through it from the inner toward the outer extremity, carrying out any sediment from the urine, and it may be kept during the intervals of its use in an antiseptic solution—a two per cent. solution of creolin, carbolic acid, or lysol. To prevent the carrying of the vaginal discharges into the urethra the parts should be carefully washed off with an antiseptic solution, either by irrigation or by means of a soft cloth, before the insertion of the catheter.

Difficult Micturition.—For the first twenty-four to forty-eight hours after delivery, particularly if the labor has been a difficult one, there is a considerable swelling of the parts which offers a mechanical hindrance both to voluntary urination and the passage of the catheter. Great gentleness is therefore required in the necessary manipulations. This swelling in an ordinary case should disappear at the end of twenty-four to forty-eight hours. Should the inability to urinate persist

after this, it is in all probability due to the condition of paralysis before referred to. Especial medication by the physician, as the use of muscle and nerve tonics, fomentation over the lower part of the abdomen and external generative organs, hot water in a bed-pan, placed beneath the patient's hips, may serve to stimulate voluntary urination. The attempt to induce this should be made each time before a resort to the catheter, as the constant use of the latter will only keep up the difficulty.

Constipation.—Constipation due to paralysis of the bowels caused by the pressure of the gravid womb upon the bowels is very marked during the lying-in.

It is desirable to have the bowels moved by injection before the end of the first twenty-four hours, and, thereafter, to secure a daily movement by such means as may be recommended by the physician in attendance. Regulation of the food will do much to correct the habit of constipation, as a laxative diet composed mainly of brown bread, oatmeal gruel, prunes, etc. An occasional enema of warm soapsuds may be needed, or from a teaspoonful to a tablespoonful of glycerin may be injected into the lower bowel, or a glycerin or gluten suppository be given. If these means do not suffice, some medication may be needed. The laxative chosen by the physician will depend upon the condition of the breasts, as well as its liability to affect the milk.

Should the breasts be over-distended, a saline laxative will be preferred. Thus, two teaspoonfuls of Rochelle salts in a half-tumblerful of cold water may be given, an additional tumblerful of pure water being taken after it. Sulphate of magnesia or Epsom salts may be used in the same way, or a teaspoonful of cream of tartar may be taken night and morning in a cup of sweetened water.

When the secretion of milk is scanty, a vegetable laxative is to be preferred, as rhubarb, aloes, or cascara sagrada.

At times there is such impaction of the contents of the lower bowel that an oil injection will be needed. A gill of cotton-seed oil may be introduced into the lower bowel and retained for three or four hours, after which a small soap and water injection will lead to a thorough evacuation of the bowel.

The Care of the Nipples and Breasts is very important. If this matter has received proper attention during the pregnancy, there will be comparatively little trouble during the lying-in. It is important to keep the nipples clean. Milk should not be allowed to collect about them, hence immediately after nursing, while they are swollen and soft, they should be washed; a soft piece of linen may be used and cold water, or a saturated solution of boric acid, after which they may be dried with a soft cloth. This should be repeated after every nursing.

If the skin of the nipple be unusually thin, it is

best to avoid having the baby pull directly upon the nipple until the milk flows freely, hence a *nipple shield* should be used, at least for the first two or three days, if not longer.

Should the nipple become sore at any time, the nipple shield should again be resorted to and used until the sore is healed.

Some *application*, as a ten per cent. solution of tannic acid in tincture of myrrh, balsam of Peru, or a weak solution of nitrate of silver, according to the order of the physician, may be painted with a sterile cotton stick brush over the cracks in the nipple while it is soft and swollen, immediately after nursing. A very healing application consists of a paste made of equal parts of bismuth subnitrate and castor oil. This can be kept constantly applied in the intervals of nursing. This may be wiped off when the time for nursing arrives, but need not be entirely removed, as it cannot hurt the baby. This paste or the application of a little oil or cold cream to tender nipples will often prevent their cracking.

For any nipple shield to work perfectly it must fit tightly, hence an entire rubber shield is not so good as some others. Some shields are made of part metal and part rubber, others part rubber and part glass.

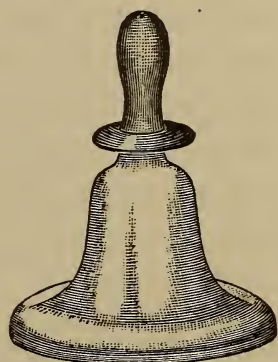


FIG. 42.—NIPPLE SHIELD.

The cheapest are the ordinary glass shields with rubber nipples. They cost about fifteen cents and are quite as good as those that are higher priced.

A shield is not good if it allows the nipple to be drawn out too far. In the intervals of nursing the rubber nipple should be kept in cold water after having been turned inside out and thoroughly cleaned with a brush.

Nipple protectors are worn only in the intervals of nursing, or during pregnancy, for shaping the nipple.¹ These may be made of lead, glass or wood. Leaden protectors keep the nipples soft in the intervals of nursing, and have a healing effect upon the abrasions and cracks of a tender nipple. Unless care be taken, however, to cleanse the nipple thoroughly before the baby nurses, there is danger of lead-poisoning. Nipple protectors of glass and wood, being open at the top, are intended more to keep the clothing of the patient off the tender nipple.² The nipple may, in addition, be kept moist in the intervals of nursing by the application over it of a cap of absorbent cotton saturated with equal parts of glycerine, listerine and water.

Shape of Nipples.—Nipples vary much in shape—thus they may be cone-shaped, hollow, mushroom-shaped, and depressed.

¹ See Fig. 17, page 50.

² There is a form of nipple protector made of glass which also acts as a reservoir to catch the overflow of milk in cases where it flows involuntarily from the nipple. This is useful in preventing the constant wetting of the patient's clothing.

The *cone-shaped nipple* is the best, as it can be readily seized by the child's mouth, and the pressure of the baby lips does not constrict the nipple at its base, so as to prevent the free escape of milk from the mouths of the milk ducts which open at the top of the nipple. The *mushroom-shaped nipple* has so narrow a base that the free flow of milk may be thus prevented.

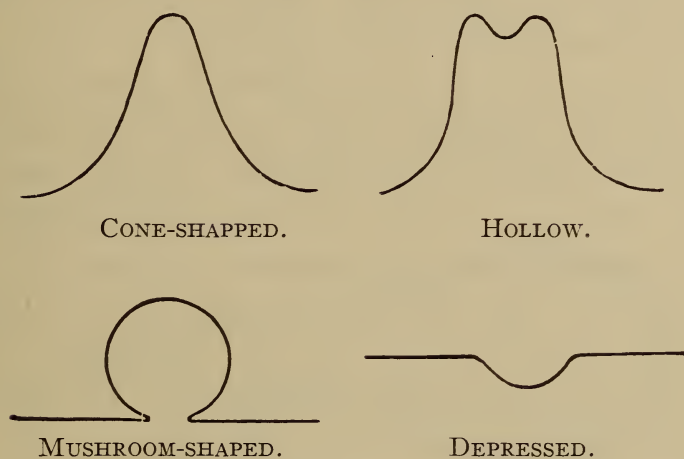


FIG. 43.

The *hollow nipple* is apt to get sore from two causes: first, by the forcible suction made by the child in emptying the breast; second, by the accumulation of milk in the depressed portion of the apex.

The *depressed nipple* differs from the last class in the fact that there is no elevation of the nipple above the surface of the breast, but where the nipple should be there is a corresponding depression. Very little may be done for such a nipple, and all efforts to make a

nipple by drawing it out must generally be abandoned, as they only irritate the tender skin.

Bandaging of Breasts.—It is best when nipples of this class exist to abandon the idea of nursing the child, and prevent the accumulation of milk in the breasts by bandaging. This should also be done where there is a previous history of breast abscess—the breast affected being thus bandaged to prevent the attempt at secretion by the gland.

The firmest bandage is the *figure-of-eight of the breasts*, which may be applied to one or both of the breasts according to need. If it cannot be used, the wide, straight bandage, similar to an abdominal bandage, may be employed, or the straight bandage with straps to fasten it over the shoulders, according to the pattern shown in Fig. 28. Were the milk permitted to accumulate in the breast, and there be no ready outlet for it, “caked breast” would be apt to ensue.

“**Caked Breast**” is caused by a collection of milk in one or the other part of the breast, due to blocking up of a milk-duct. The indications for its relief are to *empty the breast*. The milk may be drawn out by a baby if there be a proper nipple, or by the use of the *breast-pump*.

The breast may be *gently rubbed* with warm oil and stroked from the base toward the nipple to aid in carrying the milk toward the mouths of the milk-ducts. Camphor liniment is sometimes used as an inunction, alone or combined with laudanum; but unless it is the

intention to help to dry up the milk, camphor should be avoided.

The use of *fomentations* before rubbing greatly helps to soften up the breast. By fomentations is meant the application of flannels wrung out in hot water, constantly changed as they cool. These applications should be continued for fifteen to twenty minutes at a time. After their use if the baby be put to the breast or the breast-pump be used, the milk will generally flow quite freely.

A new method for the relief of congested breasts is the application of *Bier's suction hyperemia* for ten minutes two or three times a day.

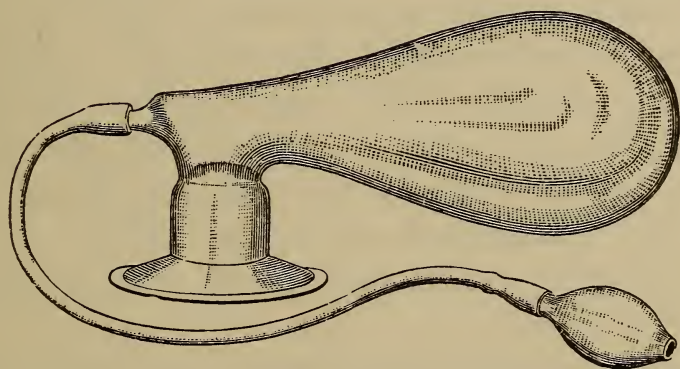


FIG. 44.—BREAST-PUMP.

Breast-pumps.—Those breast-pumps are the best which depend for suction on the power of the mouth. The Phoenix breast-pump is the one generally preferred.

They may be used by the nurse, or a patient may use such a pump herself should a nurse not be present. Hand-pumps are not good, as too much force

is apt to be used in making suction—the nipple may thus be torn off. Where a breast-pump cannot be had, a simple contrivance may be resorted to for emptying the breasts which is often very effective. A bottle filled with very hot water may be emptied of its contents, and while still hot the mouth of the bottle closely applied over the nipple. As the bottle cools, the nipple is drawn up into the neck of the bottle, and the flow of milk induced.

Pendulous Breasts.—When the breasts are pendulous, *handkerchief bandages*, properly applied, make a good support.

Their application is as follows: “The base of the handkerchief, folded as a triangle, should be placed obliquely across the chest and under one breast, with the apex or summit of the triangle over the corresponding shoulder; one angle is carried over the opposite shoulder, the other under the axilla, or armpit, of the same side. These ends should be tied on the back of the shoulder, and the apex of the triangle pinned to them.” (Smith.)

Should both breasts need support, a similar bandage may be applied to the other breast. To prevent the base of one or both of these bandages from slipping up, the ordinary handkerchief bandage has been modified in the Woman’s Hospital by the addition of a belt around the waist, of a strip of muslin or ordinary roller bandage, to which the base of the bandage may be fastened by safety-pins.

A *simple straight bandage*, with a compress to lift the outer, pendulous portion of each breast, is sometimes used, darts being employed to shape it properly to the person. This makes a firmer support than the

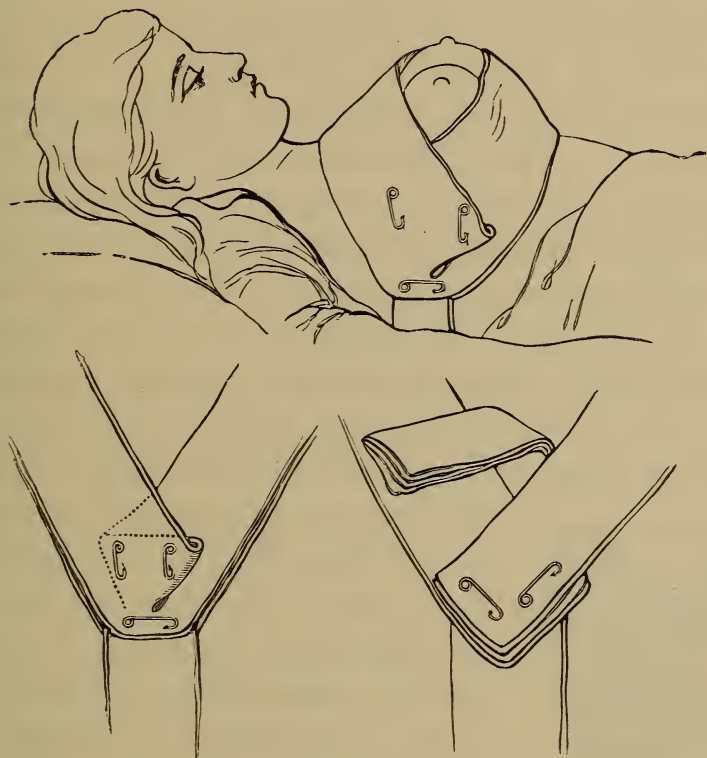


FIG. 45.—WORCESTER'S Y-BANDAGE.

The upper figure shows the double-Y breast bandage in position; the lower left-hand figure shows how the bandage is made. The third figure shows how the double-Y bandage is completed by fastening the arms of the Y to the tailpiece on the patient's opposite side.

handkerchief bandage. It should be made of unbleached muslin or some firm material.

Another bandage, which has the advantage of not requiring to be removed when the baby nurses, is the

double-Y bandage, used in the Boston Lying-in Hospital. The manner of putting it on is thus described by Dr. Worcester: "A single T-bandage is first made by folding a napkin lengthwise so that for an average-sized patient it shall be 32 inches long by 3 inches wide. At the middle of this, and at right angles to it, is pinned, just between its folds, a napkin of the same size, similarly folded. This T-bandage is next made into a Y-bandage, by making a diagonal fold in the middle of the cross-piece and fastening the corners of the plait with safety-pins on the outside. The bandage is now ready to put on. The tail-piece is passed under the woman's back, snug up to her armpits, so that the fork of the Y just clears one nipple when that breast is held upward and inward on the chest. The tail-

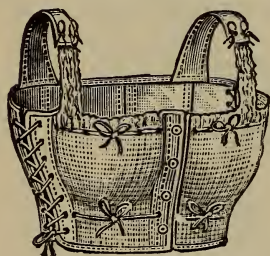


FIG. 46.—OBSTETRICAL
BREAST SUPPORT, WITH
KNITTED BOSOMS.

piece on the other side is carried up on the chest directly over the breast. The arms of the Y are then brought over the chest, one above and the other below the breasts, and their ends pinned to the tail-piece, so as to hold both breasts in similar position. A compress of soft linen may be placed between the bandage

and the outside of the breasts, and also between the breasts, to prevent their chafing. To keep the bandage from slipping down, straps of muslin may be passed over the shoulders and pinned back and front. To keep it from slipping up, it may be fastened to

the abdominal bandage." The bandages referred to are very useful while the patient is in bed, but when she begins to sit up and wear ordinary clothing they will be found to be cumbersome. Some such breast support as is shown in Fig. 46 may then be found very useful.

Gathered Breasts.—There is nothing in the care of a lying-in patient for which a nurse receives more blame than in the occurrence of gathered breasts. Abscesses will sometimes occur, however, in spite of all precautions, even before confinement. Extreme watchfulness and a prompt reporting of any symptoms of beginning trouble, as chilliness, hardness of the breasts, sore nipples, etc., will do much to avert them. It must never be forgotten that *sore nipples*, by offering an open surface upon the mother's body, may become *avenues of septic infection*. Dirty hands or dirty garments touching these surfaces or poison from the baby's mouth may thus enter the mother's system. One of the most serious forms of inflammation of the breast may thus result from blood-poisoning. If the breast has once gathered, there will be a tendency for it to gather again. Should an abscess threaten by beginning inflammation of the breast, the treatment will, of course, be directed by the physician. What milk is in the breast must be drawn out, and some means used to prevent further secretion. The use of an ice-bag to arrest tendency to inflammatory involvement is advised by some, the breast being at the same time elevated and com-

pressed by a bandage. Belladonna breast-plasters were at one time much used, the circular breast-plasters being obtained at any drug store. The belladonna ointment spread on patent lint, shaped to the breast is preferred by some physicians. Simple *compression of the breast by a firm bandage* is generally sufficient, without the aid of other measures, in the checking of the secretion after the breast has been emptied.

Should the breast gather, *lancing* is inevitable, and the sooner the better, so that a nurse should keep the physician carefully informed as to the condition of the breast. Flaxseed poultices or, far better, antiseptic poultices (consisting of several layers of sterilized gauze wrung out of hot sterile water and covered by gutta-percha tissue), may need to be applied for a time, both before and after lancing. These poultices, to do any good, should be applied as hot as possible. The nurse can test the heat of the poultice by laying her cheek against it. If she can bear this application without finding it too hot, the patient will also probably be able to bear it. If the poultice be made of flannel it will not lose its heat as quickly as when made of muslin. The poultices will require changing about once in two hours, or often enough to keep them warm; and should be kept up until the abscesses point and are evacuated. The nurse should encourage the patient to have an abscess lanced, and should have prepared, at the time of the operation, the antiseptic solution preferred for the physician's hands and for washing out the abscess cavity, a syringe,

if possible, a pus-pan having a concave side to fit closely under the breast, some narrow folded gauze packing or drainage tubes of rubber, soft towels, and some absorbent cotton to be used in place of sponges for cleansing the breast. Before the operation, the breast should be washed off with an antiseptic solution. Between the applications of the different poultices the breast should be similarly washed off by the nurse. The physician will probably desire to wash out the abscess cavity daily so long as the discharge of pus continues, in which case the nurse should have everything in readiness at the time of his expected visit.

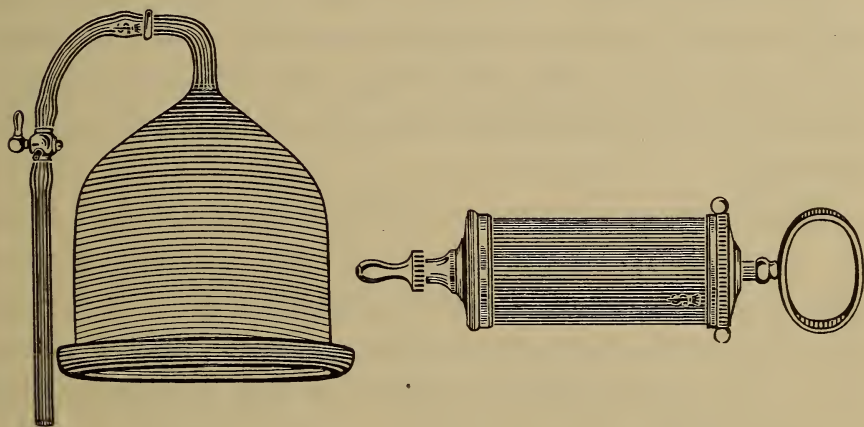


FIG. 47.—BIER'S HYPEREMIA APPARATUS FOR MASTITIS.

Bier's suction hyperemia is of great benefit in the after treatment of breast abscesses. At the second or third dressing, drainage tubes and packing may be removed and the breast bell applied. Hyperemia is induced for five or six, five-minute periods with pauses of a minute

between. The intermittent suction thoroughly empties the abscess cavity rendering irrigation and packing unnecessary, while the artificially induced hyperemia stimulates the processes of repair.

Galactorrhea.—Sometimes milk runs constantly from the breasts. Much may be done to prevent this by regular nursing. If it persists, the amount of liquid in the food should be restricted. Sometimes the milk runs from the opposite breast while the baby is nursing at one. There is no way to prevent this. Some mothers collect it as it drops in a small bottle or cup and feed it to the baby.

Insufficient Milk.—If the mother has only sufficient milk for half the day, the baby had better be artificially fed by day, the breast milk being reserved for the night, as giving less trouble when the care of the child devolves upon her.

After-pains are the same as labor-pains, being caused by contractions of the womb. They are called after-pains because they occur after confinement. A woman, after the birth of her first baby, seldom has after-pains. They may occur with varying severity in women who have previously borne children. If the bladder and the bowels are properly attended to, and the womb kept well contracted, the patient is not likely to suffer much from after-pains.

These pains seldom last over the second day. Should they do so, it is probable that the patient is threatened with some inflammation.

The occurrence of after-pains should, of course, be at once reported to the doctor, and such measures for relief carried out as he may suggest.

The womb will be found to be in two entirely different conditions with the occurrence of these pains. Hence, we divide the pains into two classes, the "*expulsive*" and the "*spasmodic*," or "*neuralgic*."

With *expulsive after-pains* the womb, as it is felt through the abdominal walls, will be found to be large and soft, and the patient will often pass clots. The bladder will be frequently found to be over-full and the womb pushed high up or to one side. The indications are to empty the bladder and to secure good contractions of the womb. After the bladder is emptied the pain may be relieved by the application of a hot poultice over the lower part of the abdomen, and fluid extract of ergot may be given, if desired, by the physician ($1/2$ teaspoonful every three hours), until the womb is well contracted. A nurse should never give any medicine without the direction of the physician. Before entire relief is obtained it may be necessary for the physician to break down and wash out the clots within the womb.

Intra-uterine Injection.—The nurse should slip drawers and stockings on the patient in preparation for this operation, as she may need to lie across the bed with her hips drawn to its edge. A bed-pan, syringe, antiseptic solutions, receptacle for waste water, and rubber protective for bed and floor should be prepared.

When *spasmodic after-pains* occur, the womb is felt in

the lower part of the abdomen as a firm, round ball of stony hardness. This is caused by a spasm of the muscle fibers in the womb. The remedies which would help expulsive pains would only aggravate this condition. Something must be employed which will quickly relax the spasm. The most efficient agent is chloroform liniment, which may be applied on flannel over the lower part of the abdomen. The acute counter-irritation thus produced will give relief. Should the spasm be very severe, the physician may apply pure chloroform sprinkled on blotting-paper, for a few seconds, over the lower part of the abdomen until it well reddens the skin. Should no chloroform liniment be at hand, a warm flaxseed poultice may help to some extent, though not so efficient, as a rule.

A Careful Report should be kept by the nurse, from which the physician can learn all that has transpired in the intervals between his visits.

Sheets of paper, ruled and having headings, as in the accompanying diagram, are used in the Woman's Hospital.

Observation of Symptoms.—The occurrence of pain, any complaint of chilliness or a decided chill, rise of temperature, rapid pulse, sleeplessness, headache, want of appetite, etc., should be carefully noted and brought to the physician's attention.

DIAGRAM SHOWING NURSE'S REPORT. ABOUT ONE-HALF SIZE.

Patient's Name: _____

No. of page...

[illegible]

Name of Nurse...

For the first week or ten days it is well to take the *temperature* and *pulse* in the morning, at noon, and in the evening; after which, if the patient is doing well, the morning and evening temperature and pulse will be sufficient.

Should the slightest complaint of *chilliness* be made, the nurse should place extra covers around the patient, hot-water bottles, if necessary, to warm her up, and at the same time give her a warm drink, as a cup of hot tea, or even hot water.

The *temperature* should always be taken after a complaint of chilliness, and taken quite frequently, as every hour or two, when, if it be found to be rising, a note should at once be sent to the physician, who may want, under the circumstances, to see the patient at once or to institute some new line of treatment. *Pain* may be temporarily relieved by the application of a hot flaxseed poultice. Grave inflammatory and septic troubles are ushered in by such symptoms as the above, hence no time should be lost in notifying the physician of their occurrence.

Puerperal Fever.—The use of blisters, poultices, packs, vaginal injections, and medicinal remedies required in the treatment of the various forms of “puerperal fever” must, of course, be in exact accordance with the physician’s directions.

Such troubles are generally septic—that is, arise from blood-poisoning; and one very important duty of the nurse will be to see that the patient takes sufficient nourishment to combat the poison in the blood.

Stimulants should never be given without a physician's advice, but when ordered great care should be exercised in their faithful administration. Egg-nog, milk-punch, whiskey-punch, wine-whey, milk in the various liquid and semi-liquid preparations, beef-tea, broths, etc., will be called for. The nurse should be ready with devices to tempt her patient to eat, and thus give the most important aid to the arrest of the disease. The support of the strength, with extreme cleanliness and thorough antisepsis, will do much to arrest the course of the terrible maladies due to blood-poisoning.

Puerperal Ulcers.—The existence of any sores about the vulva or vagina, when discovered by the nurse, should at once be reported to the doctor. These are especially dangerous when they take on a grayish surface, as this indicates that they have already become infected by poison. If the disease is not arrested here, the whole system may be involved.

Milk Leg.—A swelling of one or both legs sometimes comes on after delivery. It is ushered in by acute pain and lines of redness accompany the swelling—the vessels of the groin, under the knee, or in the leg, will often feel like cords. This is due to an inflammation involving the veins. Sometimes blood-clots form in the veins, which may be dislodged and carried to the heart and lungs, when they are the source of the gravest danger. Sometimes abscesses form in the leg. The great danger of clots being carried in the blood-current makes absolute quiet imperative. The patient should lie flat on her

back, and the limb be elevated on pillows or on an inclined plane such as the fracture-box used in certain fractures of the lower extremity.

The application of some soothing ointment, as iodin and belladonna ointment in equal parts, over the cord-like veins, a hot flaxseed poultice being kept over the ointment, will help to relieve pain and diminish inflammation. The whole limb should be kept warm by a wrapping of cotton-batting. The limb is most comfortable when slightly bent at the knee-joint. Should the weight of the bed-clothing cause pain, a cradle may be made of barrel hoops for lifting them off the limb. The cradle is also very useful in cases of peritonitis when the same difficulty exists.

Bed-sores.—Lying-in women should not be subject to bed-sores, but should some complication occur, as in some form of blood-poisoning, or should some other disease attack the patient during this time, necessitating long lying, special care is necessary to prevent bed-sores. The parts of the body subjected to most pressure should be kept thoroughly dry and rubbed with alcohol and alum (a saturated solution) once or twice daily. A little cosmolin may then be rubbed into the skin, or some drying powder, as zinc or starch, may be used. When a sore occurs it must be dressed, according to the physician's order, with zinc ointment or cosmolin. All pressure should be kept off it, if possible, by the adjustment of pads and pillows or a rubber-ring cushion.

Puerperal Mania is a form of mental trouble which may affect lying-in patients, particularly when they are exhausted from any cause, whether it be mental worry or physical ill-health. In true mania the patient may be violent and very difficult to control. In the melancholic type of this trouble she is exceedingly depressed, distrusts her best friends, and cannot be roused to take an interest in her surroundings.

As soon as it is noticed that the patient's mind is not well balanced, *the baby should be removed from the room*, only being brought to the mother when asked for. The nurse should then keep a close watch over it, as one of the chief symptoms of this trouble is a strong aversion to the baby and desire to destroy it.

It should never be forgotten that an insane patient *should not be left alone for a moment*. The insane are very cunning, and though apparently asleep may be but watching their opportunity to indulge in some mad freak, as jumping out of the window, dashing down the stairway and out of doors, etc., The windows, therefore, should be in some way protected. A nail or screw may be driven into the window-casing so as to prevent the raising of the sash, except so far as ventilation requires. The door had best be kept locked, the nurse keeping the key.

The *treatment* will consist mainly in keeping up the nourishment and in kind, gentle tactful management. The patient should be made to interest herself in outside things, by the judicious turn given to the conversation

by the nurse, by engagement in some kind of fancy-work or in games which will help to divert the mind.

She should not be crossed, neither should she be deceived. The nurse should so manage her as to inspire a thorough confidence and liking toward her on the part of the patient. If she has not these, she had best give up the case, as she will not be able to help the patient.

Should the patient absolutely refuse to eat, the physician may direct the nurse to introduce the food into the stomach by means of a rubber tube passed through the nostril and down the esophagus, or gullet. Care should be taken to do no injury in the introduction of this tube, which should be well greased with cosmolin and made to follow closely the direction of the passage it is made to enter. A funnel is then connected with the outer extremity, through which the milk or broth, etc., may be poured into the stomach.

Should the patient be exceedingly restless, and disposed to jump out of bed, to her own detriment, she may be fastened into the bed by means of a sheet, doubled lengthwise, placed over the middle portion of the body from the arm-pits to below the knees and carried under the bed, to be fastened either beneath the bed or to one side of it. The feet may be bound together loosely at the ankles by a piece of roller bandage and fastened to the footboard of the bed. The hands may be bandaged (being placed the one on top of the other) by means of a roller bandage, though this is not necessary except when they are used to do herself injury. When

patients are so violent as to need such restriction, however, it is better to have them removed to some institution for the insane as soon as possible, where there is better provision made for their management. The use of sedative remedies by the physician will generally prevent the necessity for resorting to such extreme measures for confining the patient in ordinary cases.

Medicines should, of course, never be left in the patient's room, even when the nurse is there, unless under lock and key. The duration of this malady varies from weeks to months, in some cases becoming chronic. Convalescence is generally very gradual. Patients may have long periods of lucid thought, and seem apparently well, only to unexpectedly return to their vagaries; so that the nurse should never relax her quiet vigilance while in charge of the case.

The First Sitting-up.—The old time-honored belief that a woman should sit up on the ninth day is subject to many exceptions, which should be understood by the nurse as well as the physician. The *true gage is the progress of involution*. This may be determined by the height of the uterus (which ought to sink behind the pubic bone before the patient is allowed to sit up) and by the character of the discharges. So long as there is any blood in the discharges the patient should not sit up, for this is an indication that involution, or the shrinking of the womb, is not going on properly. This condition is known as "*sub-involution*," and if neglected may lead to chronic disease of the womb. The use of the recum-

bent or semi-recumbent posture, frequent hot injections given by the nurse, or remedies administered by the physician, may be necessary to overcome it. Let the patient understand the wisdom of her confinement to bed under such circumstances, and she will generally yield gracefully to the necessity. The first sitting-up should be in bed, the patient's back being supported by a bed-rest. Should no bed-rest be found in the house, a chair turned upside down, with its back toward the patient, over which a pillow is placed, offers a very good substitute.

After sitting up in bed for a day or two, from a half-hour to an hour if there be no discharge, the patient may have her flannel wrapper and stockings and bedroom slippers put on, and be allowed to sit up in an easy chair. It must be remembered that this is the time when the patient will be most susceptible to cold, therefore every precaution must be taken to prevent her exposure to draughts. Should the patient seem to grow tired before the half hour or hour is up, she should be put back in bed. The interval for sitting up may be gradually increased from day to day, until she is up the greater part of the day. No going up and down stairs should be permitted until the physician sanctions it, which is, in ordinary cases, about the fifth or sixth week, when one such journey a day is generally permitted.

Order-Chart.—That there may be no misunderstanding between physician and nurse, the orders of the physician in every case should be immediately set down

in writing when given, so that by constant reference to them the nurse may do her full duty by the patient. It is well, for this purpose, to have a piece of paper ruled so that at the right side there shall be two columns, one headed A. M., the other P. M. The stated hours for the administration of medicine or carrying out of treatment may then be placed opposite the special directions for each, and a pencil mark be drawn through the figure representing the hour when the matter has been attended to.

An *order-chart*, as used in the Woman's Hospital, is prepared as follows:—

ORDERS FOR TREATMENT OF MRS. RICHARDS, OCT. 10, 1889.

	A. M.	P. M.
Full breakfast, dinner, and supper	6	12, 6
A teaspoonful of medicine (light or dark)	6.30	12.30, 6.30
Sponge bath	10	
Lunch of gruel or beef-tea	9	3
Glass of milk at bedtime		8
To sit up half an hour with bed rest		2

Nurse's Name

A fresh chart should be prepared for each day's work. In ordinary cases, which run an uneventful course, these boards, with the hours crossed off, serve the purpose of a report as well.

CHAPTER XIV.

CARE OF THE NEW-BORN INFANT.

The mother being made comfortable after her delivery the nurse should turn her attention to the infant.

First Toilet.—Everything needed for the baby's *first toilet* should be collected and placed conveniently at hand, near the register, stove, or open fireplace.

The nurse should put on a flannel apron or pin a crib-blanket or flannel petticoat over her lap. The best bath-apron is one consisting of two pieces of flannel fastened to the same waistband. The lower piece is the one on which the baby lies; the upper serves as a covering. A pitcher of warm water and one of cold must be provided, the baby's bath-tub being placed near them, the baby-basket, suit of aired clothing, and jar of rendered lard or oil within reach. The nurse should pick the baby up with its wraps and place it in her lap as she seats herself on a low chair or stool near the fireplace.

The baby will be found to be covered over portions of its body by a white, greasy, substance, called "vernix caseosa," or "cheesy varnish." This substance is found in greatest quantity on portions of the body subjected to friction while in the womb, hence it serves to protect the child's skin.

Some kind of grease is needed for its removal. Rendered lard and oil are the best. Cosmolin is not so good, as it is stiffer than the other two—not so soluble a fat. Lanolin is good. All this cheesy substance must come away with the first washing, as, if left, it irritates the skin and produces sores. The most difficult parts of the body to cleanse are the folds or creases. The nurse should take a piece of lard about the size of a walnut, rub it over the palms of both her hands, and then, taking the child's head between her hands, rub the grease thoroughly in, giving especial attention to the ears. A second piece of lard, of the same size, will be needed for the neck, shoulders, arms, chest, and back; a third piece for the groin, external generative organs, and lower limbs. The creases and folds about the generative organs, especially of a girl baby, need very careful cleansing. When the baby has been completely covered, the nurse should take the corner of a dry sheet and rub off the grease. Many physicians prefer not having the baby bathed after this greasing. It may then be dressed and laid in its crib.

Should the bath be preferred, the nurse should wrap the baby up in her flannel apron, draw the bath-tub toward her, and prepare the bath, filling the bath-tub about one-third full of warm water at a temperature of 100° F., tested by the thermometer. A wall-thermometer, costing fifteen cents, may be obtained at any drug-store for the purpose. The baby is then placed in the tub, its entire body, excepting its head, being immersed

for a moment or two beneath the water. The nurse should keep the baby from slipping from her grasp by allowing its head to rest against her left wrist and hand, while the fingers of the same hand obtain a secure grasp under the child's left arm-pit. After the dip, the child is lifted out on to the nurse's lap again, where a soft, warm towel should have been spread for its reception. In this it should be wrapped and thoroughly dried. Great care must be taken to see that the arm-pits, groins and other parts of the body where creases exist are entirely free from moisture. Many physicians prefer that the child should not be put in the tub until the cord drops, a daily sponge bath being given until this occurs. The baby should always be thoroughly washed with simple warm water over the parts of the body soiled every time the napkin needs to be changed. Soap does not need to be used. Its frequent use would irritate the skin, and the parts can be perfectly cleansed without it.

The use of *powder* in the folds and creases of the body is not essential. The main object is to keep rubbing surfaces dry, and should the nurse properly attend to this duty after the bath this, with the use of flannel next the baby's skin, ought to be sufficient to effect the purpose. Should a powder be desired, some very fine, un-irritating powder, such as plain talcum, might be used. Many of the scented powders contain substances which are irritating to the skin.

Dressing the Cord.—After the baby has been dried, the stump of the cord or navel-string should be attended

to. Slit up a square of soft sterilized linen or gauze to its center. Put this around the cord, which is slipped through the slit (the slit looks upward toward the child's head), fold over the ends, and turn the whole upon the left side. Apply a bandage of sterile gauze to hold this dressing in place. Some physicians will direct that no dressing be placed around the cord. In fact, sometimes there is no ligature placed around it, but it is simply well stripped of the blood and jelly-like substance which help compose it, and thus allowed to dry.

The placing of the cord with its dressing on the left side of the child's body is to avoid pressure upon the liver, which is larger than any other organ in the infant's body at birth, so large, in fact, as to extend quite down to the navel. The abdominal bandage is put on over the bandage of sterile gauze.

A drying powder, consisting of one part salicylic acid and five parts starch, is an antiseptic application thought by some to hasten the drying of the cord. Boric acid is sometimes used in the same way.

The sterile dressing should be renewed daily. The abdomen around the navel being carefully washed with a boric acid solution each time. A cord kept dry by the frequent change of dressings will have no odor about it, and will drop, on an average, by the *fifth day*. The base from which the cord dropped may continue moist for a few days, and is best dressed by placing a small compress of antiseptic linen or gauze over it.

To prevent this from sticking, a little boric acid powder may be dusted over the moist surface. The navel-dressing is kept in place by the application of the flannel binder, which should be carefully adjusted, so as not to compress the abdomen too tightly. After the bandage is fastened, the nurse's hand, used flatwise, should be easily slipped in between the bandage and the baby's skin. Should safety-pins be used in fastening the bandage, they should be placed in front and not at the back, or they may cause the baby discomfort in lying. The bandage fastened by the tapes, which is simply wound around the body, is safer on this account.

Great importance should be given to the proper care of the navel, as it offers an open surface on the child's body through which poisonous matter may be taken into the blood, causing "infantile sepsis," or the blood-poisoning of infants.

Meconium.—Before the dressing of the cord, a napkin should have been laid beneath the hips of the infant, as there is very apt to be a free discharge of a dark, greenish matter from the bowels shortly after the birth. This is known as "meconium." It should always come away within the first twenty-four hours after birth, and may continue to come at intervals for three or four days. When it does not come away freely the baby may suffer considerable pain. A soap suppository or a small injection of warm water will bring about relief, causing an evacuation of the bowels.

This substance is very difficult to wash out of napkins, hence it is a good plan to have a soft piece of old muslin placed inside the napkin to catch the discharge. This may be burned when removed.

Cleansing.—The baby should be washed every time the napkin needs to be changed, even if it is only wet. Warm water should be used. A napkin should never be used twice without washing. The habit of hanging up a napkin wet with urine, allowing it to dry, and using it again, is not only filthy, but unsafe, as it renders the napkin irritating to the skin and a source of possible septic infection. For the same reason a napkin should be changed as soon as it is wet or soiled. Though the work may be irksome, a nurse should not weary of it; for it is only by eternal vigilance that the child can be kept in good condition.

Clothing.—After the application of the binder and napkin, the baby's under-vest, or little, long-sleeved, high-necked flannel shirt, should be put on. This should be fastened in front by safty-pins, or small, flat buttons or tapes.

If the shirt is too large, folds should be made at the sides to make it fit better; never in the back, because of the ridge this would produce under the surface upon which the baby lies.

The socks come next, and then the flannel slip, constituting the only other garment the baby *needs*. The petticoat with slip, or Gertrude suit, may be used instead, if desired.

Eyes and Mouth.—The eyes and mouth should each be washed out with a separate soft piece of linen dipped in warm water.

The Baby's Hair. if it has any, may be brushed with a soft baby-brush. No comb should be used, as the scalp is too tender.

After care.—The baby should then be placed in its crib, on its *right side*, and warmly covered. The weaker the baby is, the warmer it will need to be kept. Stone jars, when filled with hot water, are nice for this purpose placed around the child, but care should be exercised not to let these bottles be placed so near as to cause a burn.

In another chapter we will consider the care of premature infants.

The weighing of the baby devolves often upon the nurse. A steelyard being provided, the nurse may place the nude child in a napkin, tied or pinned securely at the corners. This may be swung on to the hook of the steelyard as it is held up. The pointer will then indicate the number of pounds weight. The average weight of a new-born baby is 3250 grams (about seven pounds).

In the Woman's Hospital the ordinary grocer's panscales are used, the weights being represented in grams. The daily weight is taken and recorded on a card which hangs by a ribbon or string to the baby's crib, so that its daily condition may be carefully watched. For a comparison of the approximate weights in the metric

and avoirdupois scales, I append the following table of equivalents:—

RELATION OF AVOIRDUPOIS TO METRIC WEIGHTS.

Avoirdupois Pounds.	Grams.	Avoirdupois Pounds.	Grams.
1	453.59 ²	6	2721.55
2	907.18	7	3175.14
3	1360.78	8	3628.74
4	1814.37	9	4082.33
5	2267.96	10	4535.92

For the first three or four days a baby will lose weight as it does not take in enough nourishment to make up for the loss it sustains by the newly acquired activity of bowels, bladder, and skin. At the end of the first week the baby should weigh about what it did at the birth. After that it should gain on an average, thirty grams a day (about one ounce) for the first two months of its life.

A Sponge Bath is sometimes given the baby at the close of the day, when its clothing is changed for the night; but this is not necessary, if it has been properly attended to when the napkins have been changed. The fresh clothing at night is always essential.

The Baby's Crib should have no rockers. All unnecessary swinging, rocking, and jolting of babies only serves to make them nervous and more troublesome to take care of. A convenient and inexpensive crib and bath-tub combined, especially for traveling, is described in one of the numbers of "Babyland" thus: The frame is made something like a cot-bed. Straight

pine sticks may be used. The legs, one inch and a half square by thirty inches long, are crossed and pivoted in the middle on a center bar. The side bars, one inch by two inches, and thirty-six inches long, are securely fastened to the top of the legs. Smaller bars join the legs near the bottom to stiffen the frame. A piece of heavy rubber cloth, one yard and a quarter long

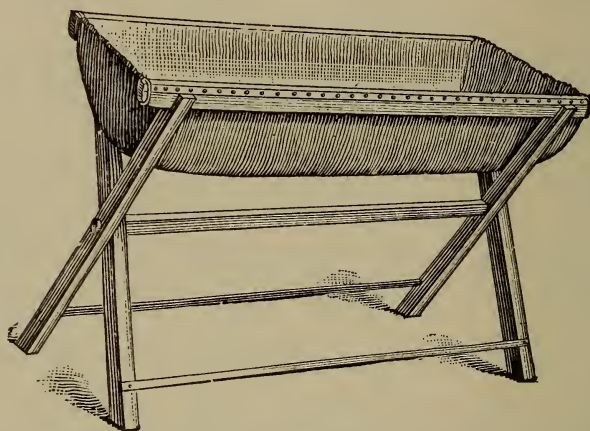


FIG. 48.—HOME-MADE BATH-TUB AND CRIB.

and thirty inches wide has an inch-wide hem on each end for a casing, and is drawn up to eighteen or nineteen inches with heavy braid (a leather strap would probably be better).

This makes the ends of the tub. Along the side bars of the frame are tacked with brass-headed tacks the sides of the cloth, the braid (or rubber straps) being securely fastened to the ends. A small plait in the cloth at each corner, about an inch from the end, gives a fuller shape to hold the water (when it is in use as a bath-

tub). The tub (or crib), when not in use, can be folded and set away out of sight, or it may be carried in the bottom of a large traveling-trunk when on a journey. The frame may be made of walnut or cherry, with turned legs, etc., if so desired. A pillow put in the tub makes a comfortable and portable crib for the baby.

Children should never sleep in the same bed with their mothers. It is unsafe because there is danger of their being overlaid, and it is unhealthful because of the discharges, breath, etc., of the mother.

Tubs for Babies.—Many varieties of *tubs* are made for babies, of tin or agate-ware, or porcelain. A tin foot-tub, unpainted, serves a good purpose while the child is small. These may be placed upon a bath-stand or low chair to prevent the necessity of too much stooping on the part of the nurse while bathing the baby.

Training of a baby.—A baby may be trained to be contented and happy as it lies in its crib. If from its earliest days it is taken up simply to be fed, and to receive the necessary attentions for keeping it clean and comfortable, it will not become the little tyrant a child develops into when foolishly spoiled by its mother.

Feeding of Infants.—Babies should be fed but once in *two hours during the day*, and every *three hours during the night*, unless premature, when they take less, and should be fed every hour. An interval is necessary between the feedings in order that the stomach may rest and be prepared properly to carry on its work of digestion. Hence the habit some mothers have of letting

babies nurse whenever they cry simply serves to produce indigestion, as well as to spoil the child.¹

For its *first nursing* the baby may be put to the breast an hour or two after labor, if the mother is sufficiently rested. The nipples should, before each nursing, be carefully washed off with a solution of boric acid. The early secretion of the breasts, known as "colostrum," helps to rid the baby's bowels of their dark, tarry contents, as it is laxative. It is important that the breasts should be used alternately in feeding the infant, as this allows a longer time to elapse for the accumulation of milk. For the first day or two the baby needs comparatively little food. Should it seem to be hungry, however and the mother unable to satisfy it, a teaspoonful or two of warm water or diluted peptonized cow's milk, prepared according to the suggestions to be given later, may be administered at regular intervals.

Before and after each feeding, the baby's mouth should be carefully washed out with a piece of soft linen dipped in warm water or a saturated solution of boric acid. This is to prevent the particles of milk remaining in the mouth from producing soreness by souring.

Two or three times daily a baby should be given a teaspoonful of *cool water to drink*, as babies suffer from thirst just as their elders do. The water assists, also, in keeping the bowels from becoming constipated. The water should be boiled and kept in an air-tight flask.

* ¹It has been observed that when the periods between nursing were short the milk was more condensed, a fact which throws light on the dyspeptic phenomena occurring in babies who are fed too often.—*Rotch*.

Insufficient Milk.—Should the mother not have sufficient milk for her baby, it may have the bottle every other time, the additional food being selected with reference to the child's age and powers of digestion.

The Wet-nurse.—When a mother has no milk, the best substitute is a good wet-nurse. A wet-nurse should always be carefully examined by a physician, that her freedom from disease may be fully determined before she is employed. She should be between twenty or thirty years of age, and have good, not necessarily large, breasts, well-shaped nipples, and an abundant supply of milk. The condition of her own child should be considered, whether it be thriving or sickly, and especially whether there be any evidence of special disease. It is well, too, to try to get a woman who has had more than the one child, as a woman who has borne several children has, by experience, learned to understand and manage babies.

Lactation.—The first milk that comes in the breast, and which appears in any quantity, about the eighth month of pregnancy, is called "fore-milk," or "colostrum," from a word which means "glue." It is turbid, yellowish, gluey, alkaline in reaction, and sours easily. It differs from true milk in having a higher specific gravity or weight; it also contains more salts and more albumin, and is more difficult to digest. It is laxative in its effect upon the baby's bowels. Physicians not infrequently examine a specimen of this secretion under the microscope, to learn what the prospect is as

to the mother's nursing the child. If, in the last two months of pregnancy, the colostrum is scanty, and under the microscope there are but few oil globules, the patient will probably have poor milk and scant in quantity. If the colostrum is abundant but thin, like gum-water, not gluey and without yellowish streaks, it is probable that the milk will be watery and not nourishing. It may be either scanty or abundant. If the colostrum be plentiful, with yellowish streaks and full of milk globules, the milk will be abundant and good in quality. The secretion of colostrum may continue from six to eight days. If it continues longer, it is a great disadvantage, and the mother may have to give up nursing because of the child's inability to digest the nourishment thus afforded.

Human milk should have a specific gravity of 1020-1034. It is slightly alkaline in reaction; that is, it will turn red litmus-paper blue, and it contains the following ingredients:—

Water,	87-88
Total solids,	13-12
Fat	3-4
Albuminoids,	1-2
Sugar,	7.0
Ash,	0.2

—*Rotch*.¹

It differs from cow's milk in having a higher specific gravity, more solids, less water, and one-fifth the

¹According to the analyses of Dr. H. Leffmann, the percentage of fat rarely reached 4, ranging between 2.5 and 3, as a rule, while the albuminoids were usually a fraction over 1 per cent.

amount of albuminoids. The milk retained longest in the breast—the first milk drawn by the baby at each nursing—is the thinnest; the last, the richest. When, therefore, a baby seems to suffer from indigestion because of its mother's milk being too rich for it, it should take the first secretion from each breast at each nursing instead of drawing all the milk from one breast. One or two teaspoonfuls of water given the baby before each nursing have the same object. Should it, on the contrary, not seem to thrive because of the food not being sufficiently rich, the thin milk should be pumped or drawn out of each breast by the nurse or mother before the baby is allowed to draw. The two breasts are estimated to contain about two ounces of milk at one time.¹

The question of *how to increase the secretion* of milk is a very important one. The best way is by a judicious regulation of the mother's or wet-nurse's diet. There are no medicines which are entirely satisfactory for the purpose of stimulating the secretions. Therefore a nurse can do more than a doctor in this line by careful feeding of her patient. A mixed diet is the best for making milk. Beer and all kinds of liquors, as porter, etc., do more to fatten the mother or nurse than to make milk; therefore they are to be avoided. In weakly women with poor appetites the malt and bitter tonics are sometimes of advantage in stimulating the appetite

¹ The use of from 1 to 5 drops of cod-liver oil, according to the age of the child, given three times daily, has been found to be a valuable supplement to the food when a mother's milk lacks richness.—*Dr. A. E. Broomall.*

and thus promoting a greater secretion of milk. The special diet for a nursing woman is laid down in another chapter. Good human milk should be three per cent. cream.¹

To determine the character of milk—human or cow's milk—an instrument known as the *lactometer*, or *milk-tester*, may be used, aided by the microscope.

The Lactometer consists of a cylindrical glass vessel, or beaker, which should contain the milk to be tested, and a specific gravity glass, which is to be floated in the liquid. This glass is graduated and marked at certain points with letters and figures. Thus, W., P., and F. The W. stands for "water," P. for "pure," and F. for "fat." Between the W. and P., at different points, are the fractions, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$. Should the weighted glass sink in the liquid so that the surface of the liquid reached the mark W., the liquid tested would have the same specific gravity as water.

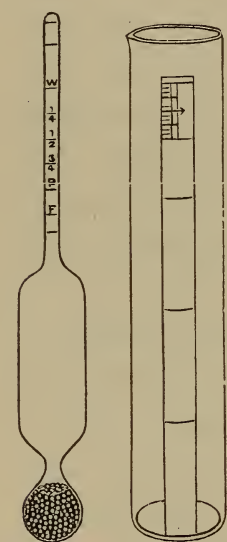


Fig. 49.—LACTOMETER.

Should the surface of the liquid reach the mark $\frac{1}{4}$, if it is milk that is tested, it would be $\frac{1}{4}$ milk and $\frac{3}{4}$ water. If the mark $\frac{1}{2}$ is touched, it is $\frac{1}{2}$ water and $\frac{1}{2}$ milk. In this way

¹ As general rule, the amount of fat may be increased by increasing the amount of meat in the diet, and the amount of albumin decreased by moderate exercise. Too little fat and too much casein make poor milk.

—Rotch.

the adulteration of the milk with water is detected. Should the level of the liquid stand at P., we would have pure milk. Pure cream would raise the weighted glass so that the level of the liquid would stand at F. An ordinary urinometer may be used to obtain the specific gravity of milk in a similar way. Dr. Louis Starr suggests a good way to discover the proportion of cream in any given sample of milk: A narrow piece of paper four inches long, is divided in its upper half inch by cross-markings into twelve equal parts. This paper is then pasted on the beaker of the lactometer with the marked portion uppermost, the lower edge touching the bottom of the beaker. Enough milk is then poured in to come just to the top of the paper, and the whole set aside for twenty-four hours. The cream rises and appears as a yellow layer at the top. This layer should have the depth of ten or twelve spaces, as marked on the paper. There is an inexpensive instrument known as the *creamometer* which serves the same purpose in determining the amount of cream in milk. On examination under the microscope, if there are but few oil globules in a specimen of milk, and if these oil globules be small, the milk is poor. On the other hand, if the oil globules in milk are too large, this becomes a cause for its indigestibility.

Should menstruation begin with a nursing mother, the milk may be so affected as to disagree with the child. Ordinarily, the menstrual flow does not recur until the *eighth month after delivery*. The appearance of the flow

need not lead to a cessation of nursing, unless the milk should seem to disagree with the child. The character and quantity of the milk is impaired by deep or violent emotions; thus, anxiety, fear, anger, etc., will greatly detract from a woman's ability to be a good wet-nurse. *Pregnancy* always deteriorates the character of milk and is an indication for weaning a nursing child.

Hand-feeding. When the mother's milk utterly fails and a wet-nurse can not be had, hand-feeding becomes necessary. For this purpose "modified cow's milk" may be used.

Cow's Milk has a specific gravity of 1029. The milk obtained from stall-fed cows gives an acid reaction; that from pasture-fed cows a less acid reaction. Could the latter be obtained directly from the cow, its reaction would be slightly alkaline, as with human milk. An analysis of the same quantity of woman's milk and cow's milk is reported as yielding the following results:

	<i>Woman's Milk.</i>	<i>Cow's Milk.</i>
Water	87.88 parts.	86.87 parts.
Total solids	12.13 parts.	13.14 parts.
Fat	4.00 parts.	4.00 parts.
Albuminoids	1.00 parts.	4.00 parts.
Milk-sugar	7.00 parts.	4.5 parts.
Ash	0.2 parts.	0.7 parts.
Bacteria	not present.	present.

The woman's milk for this analysis was obtained directly from the breast. The cow's milk was, as it is ordinarily obtained in cities, about twenty-four hours old.

By an examination of this analysis, it will be seen that the proportion of *coagulable substances* of cow's milk is much greater than in human milk. This is where the difficulty in its digestion lies. Casein of human milk coagulates in light curds; in cow's milk in firm, hard curds.

Quality of Food.—The kind of food required by different babies will vary with their constitutions. As a rule, a mother's milk is the best food for her child, and makes a good gage to start from in the preparation of an artificial food to take its place or act as a supplement when there is an insufficient supply. If, therefore, a careful analysis is made of a mother's milk and a mixture prepared which shall, so far as possible, contain the same constituents in the same proportion, we may hope that the baby will thrive on it. A steady *increase in the baby's weight* will be the best index by which we can judge of the nutritive qualities of the food it is taking.

Increase in Weight.—For the first four or five months of its life a child should gain on an average twenty to thirty grams (about one ounce) daily. For the remainder of the first year of life, a daily gain of from ten to fifteen grams will mark satisfactory progress.

In the comparatively few cases in which a mother's milk does not appear to have proper nutritive or digestive properties, it should be examined to discover in what direction the deficiency lies, and the artificial food should be prepared so as to supply the lack. The

nutritive constituents of milk are the *albuminoids*, *fat*, and *milk-sugar*.

Modified Cow's Milk.—*Cow's milk* contains about *four times the quantity of albuminoids* found in human milk, so that it requires to be diluted with four times as much water to represent the same percentage of albuminoids. Since the amount of *fat in human and cow's milk is about equal*, this dilution would greatly decrease the percentage of fat. Also, since cow's milk contains a much smaller quantity of sugar of milk than is found in human milk, the same dilution would be greatly *deficient in sugar*.

In preparing a mixture from cow's milk, therefore, that will correctly represent human milk, fat, in the form of cream, and sugar of milk must be added.

Laboratories for the preparation of modified cow's milk according to the requirements of individual cases have been established in several of the large cities. Physicians are requested to send prescriptions giving the proportions of the different constituents of milk required for their patients, and from these the preparations are made, sterilized, and served daily to the patient. The prescription can be modified whenever required to meet conditions as they arise in the course of management.

Cream varies very much in richness; hence it is desirable to know what percentage of fat is represented by the cream used in compounding a mixture. A

chemical analysis of the cream is necessary for accuracy of result in such determination. It has been suggested that to prevent too much variation in the percentage of fat, the cream should be obtained of the same person from milk that has been allowed to stand each day for the same length of time and in the same temperature.

Rotch's Formula for Modified Cow's Milk.—A mixture made up according to the following rule probably most nearly resembles the average human milk. To make one pint of the mixture for use in twenty-four hours, take milk and cream (twenty per cent.) as soon as it comes in the morning, and mix as follows:

Milk	f 3 ij
Cream	f 3 iij
Water	f 3 x
Milk sugar	3 vi $\frac{3}{4}$.

Put in a flask in the steamer and steam for twenty minutes; then remove the flask from the steamer, and when still slightly warm add lime water f 3 j. Place on ice, and give the proper amount at the proper feeding time, warming the quantity of the mixture used in a water-bath before giving it to the baby.

The object in steaming the mixture is to sterilize it, for human milk is sterile, and for that reason more digestible than cow's milk—which, although sterile while in the udder, becomes contaminated as it is placed in vessels and transferred from place to place. It is

believed by some that this steaming or boiling of milk has a tendency to decrease its digestibility. The danger from this source, however, is probably much less than that which would arise from the presence of germs in the milk, such as have been shown to exist. "*Fractional sterilization*," the heating of milk in a water-bath several times in succession up to a more moderate degree of heat than that required for complete sterilization (167° F.), is said not to have the same effect in decreasing digestibility of milk.

Pasteurization of Milk.—The process which is known as *Pasteurization* (after the French scientist, Pasteur) is a modification of sterilization, the temperature of the milk being brought up only to 167° Fahrenheit instead of to 212° , which is done in sterilizing. It is claimed that this process destroys the germs sufficiently for all practical purposes. It does not, however, with certainty kill the germs, hence a method has been suggested by which the milk can be brought to a higher degree of heat, and yet not lose its digestibility.

The bottles of the sterilizer are filled and the apparatus made ready in the usual way, but the hood is left off and the lid set ajar, while the heating is continued for forty-five minutes over a brisk fire. The temperature of the milk is thus brought up to about 190° . It has been found that milk thus prepared and kept in well-corked bottles will keep sweet for twenty-four hours.

Lime-water is added to make the mixture alkaline, all human milk being slightly alkaline. It should not be placed in the flask before boiling or steaming, because experimentation has shown that the lime undergoes some change in the process of boiling which causes a discoloration of the milk and the deposit of a sediment. Experiment has shown that water is the most efficient diluent to be employed in making these mixtures, as it gives a much finer curd with acids, when so used, than can be obtained by an admixture with barley-water or any of the prepared foods.

Having thus determined by analysis the *quality* of the food required for an infant, the *quantity* must be determined and also the frequency of feeding.

As to Quantity, the observations made by Dr. Ssnitkin, of St. Petersburg, have led to the formulation of a rule by which *one one-hundredth of the baby's weight* should be taken as the figure with which to begin the computation, and to this should be added one gram for each day of life.

A table prepared by Dr. Rotch, of Boston, has arranged in very convenient form the quantity and intervals of feeding for the first year of a child's life:—

GENERAL RULES FOR FEEDING.—(*Rotch.*)

Age.	Intervals of feeding.	Number of feedings in 24 hours.	Average amount at each feeding.	Average amount in 24 hours.
1st week.	2 hours.	10	1 ounce.	10 ounces.
1-6 weeks.	2½ hours.	8	1½-2 ounces.	12-16 ounces.
6-12 weeks and possibly to 6th month.	3 hours.	6	3-4 ounces.	18-24 ounces.
At 6 months.	3 hours.	6	6 ounces.	36 ounces.
At 10 months.	3 hours.	5	8 ounces.	40 ounces.

Another table arranged by Dr. Rotch shows the amount required at each feeding, according to the weight of the child.

DETERMINATION OF AMOUNT OF FOOD BY WEIGHT IN CASES OF SPECIAL DIFFICULTY.

Initial weight.	Each feeding.		
	Early days.	At 15 days.	At 30 days.
3000 grams.	30 grams. (About 1 ounce.)	30 + 15 = 45 grams. (About 1½ ounces.)	30 + 30 = 60 grams. (About 2 ounces.)
4500 grams.	43 grams. (About 1½ ounces.)	45 + 15 = 60 grams. (About 2 ounces.)	45 + 30 = 75 grams. (About 2½ ounces.)
6000 grams.	60 grams. (About 2 ounces.)	60 + 15 = 75 grams. (About 2½ ounces.)	60 + 30 = 90 grams. (About 3 ounces.)

Stomach of Infant.—A new-born infant's stomach holds about 1 1/2 ounces. The average daily quantity of food required for the first two to three months is 20 ounces; after three months, 23 ounces; after four months, 27 ounces; six to twelve months, 30 ounces. The child's appetite, however, if it be healthy, is a good gage. During the first month, 1 1/2 ounces of the prepared cow's milk may be given at each feeding, and 12 feedings given daily.

Peptonized-food, diluted, has been employed with great success by some physicians where the digestive powers in early childhood seemed at fault. The following formula may be used for the purpose:—

Into a clean quart bottle put one measure, or five grains, of pancreatic extract (Fairchild's), and one measure, or fifteen grains, of bicarbonate of soda, and a gill¹ of cold water; shake, then add a pint of fresh cold milk, and shake the mixture again. Place the bottle in water at about 110° or 115°, or just so hot that the whole hand can be held in it for a minute without discomfort. Keep the bottle there for twenty minutes. At the end of that time put the bottle on ice to check further digestion and to keep the milk from spoiling.

If heat cannot be conveniently provided, after the ingredients have been thoroughly mixed and shaken the bottle may be placed on ice and allowed to stand for an hour before it is used.

¹A gill represents 4 ounces

It must be remembered that *peptonized milk cannot be sterilized*, as it then becomes unfit for food—the process of digestion being carried so far as to curdle the milk and render it extremely unpalatable. *Sterilized or Pasteurized milk may, however, after it has cooled, be peptonized.*

If an additional aid to the digestion should be necessary, a little pepsin may be given to the child just before each feeding, or the pepsin, or any of the powdered preparations used to aid digestion that may be prescribed by the physician may be placed in the nursing bottle just as the child takes it. Pancreatic extract and soda, if used, will need to be given about an hour after the meal.

Favorite Formulæ for Modified Milk.—A preparation of modified milk which has been much used by Dr. Broomall is the following, in amount for a single feeding:—

Cream	1 teaspoonful
Milk	3 teaspoonfuls
Lime-water	2 teaspoonfuls
Boiled water	10 teaspoonfuls
Milk sugar	$\frac{1}{2}$ teaspoonful.

To make this up in quantity for sterilization the following proportions are required:—

Cream	$\frac{1}{2}$ ounce
Milk	1 ounce
Lime-water	1 ounce
Water	17 $\frac{1}{2}$ ounces
Milk sugar	6 ounces.

Formulæ in use in the Maternity of the Woman's Hospital.

First week: fat 1%, sugar 5%, proteids .75%.

Cream (10%).....	℥ii
Milk	℥ii
Boiled water	℥xv
Lime-water.....	℥i
Sugar of milk	℥vii

Give f℥iss at each feeding.

Second week: fat 2%, sugar 5%, proteids .75%.

Cream (10%)	℥iv
Boiled water	℥xv
Lime water	℥i
Milk sugar	℥vii

Give f℥ I $\frac{3}{4}$ at each feeding.

Third week: fat 2 $\frac{1}{2}$ %, sugar 6%, proteids 1%.

Cream (10 %)	℥v
Boiled water	℥xiv
Lime water	℥i
Sugar of milk	℥vii ss

Give f℥ii to iii at each feeding.

Simplified Formula for Modified Cow's Milk.—

Take of "top milk" (the upper portion of good milk which has been allowed to stand in a suitable place six to eight hours) one part, and add to this two parts of water. This gives about the same proportion of cream and curd as in mothers' milk, but lacks sugar. Milk sugar (obtainable at any drug store) may be added to this in the proportion of one heaping teaspoonful to every four ounces of the mixture. If

cane sugar is used, a teaspoonful should be added to every six ounces.¹

The Temperature of the Food should be 99° Fahr. It is a great mistake to make it too hot. The warming of the child's food should be accomplished by setting the filled nursing bottle into a vessel of hot water. It may be heated quickly over a gas jet by setting the bottle into a tin mug filled with water and holding it over the flame. Suggestions concerning the modification of food, when milk thus prepared does not agree with infants, will be given in another chapter. When the mother's supply of milk is scanty and the baby cries with hunger, occasional meals of the above preparations will be a great aid in its management.

Sterilization of Milk.—By sterilizing milk is meant the process of destroying any poisonous matter which may have found its way into it. Exposure to the atmosphere and admixture with particles of dust and dirt during its transportation, with want of care as to cleanliness of vessels, etc., in which the milk is kept, induce certain fermentative changes, which cause it to sour and to produce digestive disturbances. Sterilization destroys the germ of poisonous matter by subjecting the milk to a high degree of heat under pressure. Many forms of apparatus have been devised for this purpose. The accompanying cut represents one form. That shown in the cut consists of an oblong case of tin fitted

¹ For Dr. Rotch's formula see page 199.

with a tight cover. Into this a movable wire basket, holding ten bottles, is placed. The bottles are of flint glass, graduated, and fitted with rubber corks having a glass plug fitted into an opening in their centers. The rules for using the sterilizing apparatus are as follows:—

1st. Cleanse the bottles thoroughly.

2d. Fill each with the milk you wish to use, put in the rubber cork without the glass plug (this leaves a small opening in the rubber cork); set the bottle in the basket, then in the boiler; fill the boiler with water almost as high as the milk in the bottle; boil about ten minutes, or, better, as Dr. Starr expresses it, “until the expansion that precedes boiling has taken place in the milk”; then put the glass plugs tightly in each stopper and boil fifteen or twenty minutes more. Should the rubber corks incline to come out during the second boiling, put them in firmly.

3d. Keep in a cool place till needed for use.

4th. When to be used, place a bottle of the milk thus prepared in the tin mug which accompanies the apparatus. Pour hot water into the mug until it is as high as the milk in the bottle. Heat the milk to the temperature desired for feeding (99° Fahr.); remove the rubber cork and put on rubber nipple, and feed.

5th. Cleanse each bottle immediately after the milk in it is used. Do not keep milk in a bottle that has had some used out of it.

6th. If the steaming process is preferred, place the basket, without the bottles, in the boiler, fill with

water up to but not above the bottom of the basket, place the bottles in the basket, and proceed as before.

Milk should be sterilized or Pasteurized as soon as possible after it has been served each morning. Each bottle, when emptied, should be thoroughly washed.

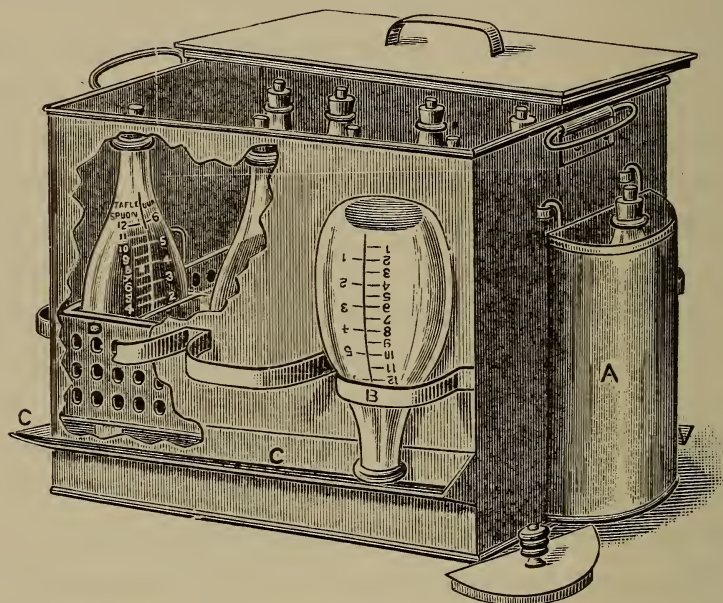


FIG. 50. STERILIZER. (*Dr. Louis Starr.*)¹

If the whole contents of the bottle are not used after it is opened, the remainder must not be used for the child nor allowed to remain in the bottle.

Milk sterilized in this way will keep for days without spoiling, as it is hermetically sealed and has been deprived of all unhealthy germs. Dr. Louis Starr makes the assertion that it will keep for eighteen days if the heating is continued for thirty minutes.

¹ "Hygiene of the Nursery."

Sterilized milk is useful when traveling, as it may be carried without any trouble, the difficulty of obtaining fresh milk being thus overcome. Its use makes the management of babies during the heat of summer much easier.

A word remains to be said concerning feeding-bottles and rubber nipples.

The Nursing-Bottle should be of clear glass, with a rounded bottom, of a shape convenient to clean, so that no particles may cling about corners which cannot be reached, serving as a source of trouble afterward. The graduated bottle is very convenient, as it enables the quantity of each of the materials used in the preparation of the feeding to be mixed directly in the bottle, instead of being first measured out in a graduate.

Feeding-bottles with India-rubber tubes should never be used for the tubes are difficult to keep clean, and a drop or two of milk left behind will often be sufficient to turn the next supply sour, causing the infant much sickness and suffering. Nurses are prone, also, with these tubes, to place the baby in its crib with the bottle of milk by its side and the nipple in its mouth. The heat of the child's body tends to sour the milk, the liquid may run low, and the child suck in considerable air. The neck of the bottle should always be kept filled with the liquid while the child is nursing, hence the position of the bottle must be changed. A feeding-bottle fitted with a rubber nipple requires to be held in the

nurse's hand during the feeding, and is, on that account, to be preferred. There should always be two nursing bottles for each baby, one being kept under water or filled with a soda solution while the other is in use. Immediately after the meal the bottle should be cleaned,

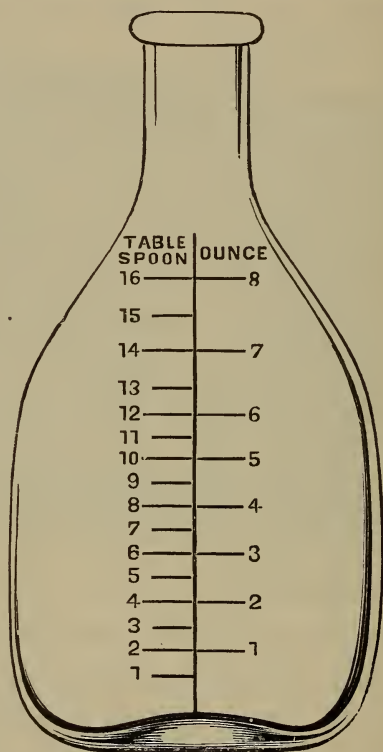


FIG. 51.—GRADUATED NURSING BOTTLE. (*Dr. Louis Starr.*)

etc., Scalding water should be used, and then the bottle filled or placed beneath a solution of bicarbonate of sodium—ordinary baking soda—a teaspoonful to the pint, until it is again needed, when the soda solution should be emptied out and the bottle thoroughly rinsed

with cold water. Some nurses use salicylate of sodium for the cleansing solution in preference to the bicarbonate.

Rubber Nipples.—Two nipples should be in use at the same time, being used alternately, and no nipple should be used longer than two weeks. A soft rubber nipple of conical shape is the best, because it can be more readily cleaned. The black rubber is generally softer than the white, and is to be preferred. The opening at the top of the nipple should not be too large, as that would permit the milk to flow through, whereas the suction produced by the child's mouth is necessary to the food being taken in a natural manner. So



FIG. 52.—RUBBER NIPPLE. (Starr.)

soon as the meal is over, the nipple should be removed from the bottle, brushed with a stiff brush, wet with cold water on the outside, then turned inside out and similarly brushed on its inner surface. It should then be put in cold water and allowed to stand until wanted. A nurse's sense of smell should be keen enough to enable her to detect the slightest sourness about a bottle or nipple.

The baby should be *fed slowly*—taking often ten to twenty minutes for its meal. Sucking from an empty bottle should never be permitted.

It is a bad plan to make the whole day's supply of food in the morning, unless the facilities for keeping it are such as to insure against its spoiling. When a sterilized preparation is used, it is desirable to have the

whole amount prepared at once in a number of small flasks, each containing the amount for one feeding.

The *sterilization* of the quantity of milk to be used during the day may all, however, be accomplished at one time.

Home-made Sterilizer.—In lieu of the regular sterilizing apparatus, milk may be similarly boiled in a water-bath formed by an ordinary boiler, the milk being contained in a glass fruit-jar with a screw lid. After coming to the boiling-point, or boiling about two minutes without the lid, the latter may be screwed on and the boiling continued. A better way is to put the jar in a colander placed over a steaming tea-kettle in place of the lid. The milk should be allowed to boil in the open jar for about two minutes; the jar lid then being screwed down, it should steam for twenty-minutes.

Fresh Air.—Besides good food and sufficient warmth, babies need an abundant supply of fresh air, hence the room should be kept pure and wholesome.

In fine weather, after the first three or four weeks, a baby should be carried out in the open air every day for a time.

It is preferable to carry the child in the arms, rather than to place it in a baby-coach. It can thus be kept warmer, and any evidence of chilling will be sooner detected by the appearance of the baby's face. When it is not practicable to take the child out, the baby warmly wrapped may be carried about in a room, the windows of which have been raised, and free ventilation obtained.

CHAPTER XVI.

CHARACTERISTICS OF INFANCY IN HEALTH AND DISEASE.

A healthy baby, if born at full term, should weigh 3250 grams, or about seven pounds. Its length should be, on an average, 50 cm., or twenty inches.

Development.—The *head and trunk* of the child are developed out of proportion to the *limbs*, so that the navel is below the middle of the child's body. This greater development of the upper part of the body is due to the fact that in the womb this portion of the child's body receives the greater amount of nourishment. The subsequent growth consists largely in the development of the lower limbs.

The *skin* of a new-born baby varies in color from a pink to a decided red. The redness is more marked in premature babies. From the third to the fourth day this redness dissappears, and the peculiar yellowish tinge, known as "baby jaundice," appears, as a result of the changes in the circulation. This is not true jaundice. This yellowish tinge of the skin should disappear by the end of the second week. At the same time that the skin begins to change color, from the third to the fourth day, it begins to scale or peel off. This is most noticeable about the fifth day, and lasts about sixteen days.

The baby's limbs should be plump and well-rounded. The abdomen is prominent, as compared with the chest.

The *shape of the head* varies very much. At times it is perfectly rounded, again it will be elongated and oval-shaped.

Pressure during labor, either from the walls of the pelvis or as a result of the use of instruments, will cause at times considerable temporary distortion in the shape of the head. To allay swelling and prevent discoloration induced by bruising, fomentations may be used, either of simple hot water; or hot water containing a little fluid extract of hamamelis. Sometimes it is better to use cold applications, if the child is not too feeble.

When there has been a good deal of pressure on the baby's head during the birth, the bones will sometimes override each other, and this will be shown by elevations or ridges upon the baby's head, which soon disappear when the head is no longer subjected to pressure. These ridges, which are converted into soft grooves on the removal of pressure, indicate the separation between the different bones of the head, and are called "sutures." The larger soft places are called "fontanelles." The largest is on top of the head just above the forehead. It is called the "anterior fontanelle," commonly known as "the opening of the head." It is about large enough for the tips of two fingers to cover, when of normal size, and is kite-shaped. A much smaller three-cornered fontanelle is found at the back of the head, and two behind the ears. These very soon fill up with bone.

The large anterior opening does not close entirely until a child is about eighteen months of age. Should it remain open longer, it is a sign of constitutional weakness. In a healthy baby the surface of this fontanelle should be on a level with the surrounding bones of the skull. A slight pulsation may be noticed in it, due to the pulsation of the blood-vessels in the brain. Should the fontanelle be much depressed at any time, it would indicate a low state of vitality. Care should be taken not to permit any undue pressure on this part of the baby's head, as the brain here lies very near the surface.

The fashion some old monthly nurses have of trying to shape the head by the pressure of the hands is dangerous, as the brain may be thus injured. As the head bones are soft, the child should not be allowed to lie too continuously on either side or on the back, as this will cause flattening of the part pressed upon.

The first *hair* of the new-born baby, if it has any, is apt to fall out. The *eyes* of all new-born babies are of rather an indefinite color—a sort of blue. A change generally occurs when the child is about two months old. At this time also *vision* is nearly perfect. A new-born baby probably cannot do more than distinguish light from darkness. *Hearing* and the *sense of smell* develop rapidly in a child. Loud noises waken it as early as during the first week. By three months of age the child shows that it has a *mind* and is capable of exercising thought. It grasps after objects and indicates by its expression and gestures its likes and dislikes. By

the age of eight or ten months it *utters several syllables*, and at the age of a year should be able to say "papa" and "mamma." By two years of age short sentences can be used.

Weight of Baby.—For the first two days of a baby's life it loses weight, but by the third day it begins to gain, and by the end of the first week it should weigh what it did at birth. The average daily gain is 30 grams, about 1 oz. The following facts concerning the early changes in weight are obtained from Gregory:—

An infant born at full term weighs from 6 to 7 pounds, 7 pounds being an average weight. For the first two or three days of life there is a loss of 4 ounces to 7 ounces, then a regular gain, so that by the eighth to the ninth day the initial loss has been made good. The following figures express the average daily loss and gain during the first six days of life—:

First day	Loss of 139 grams, or nearly 5 ounces.
Second day	Loss of 64 grams, or nearly 2 $\frac{1}{4}$ ounces.
Third day	Gain of 33 grams, or about 1 ounce.
Fourth day	Gain of 50 grams, or about 1 $\frac{3}{4}$ ounces.
Fifth day	Gain of 50 grams, or about 1 $\frac{3}{4}$ ounces.
Sixth day	Gain of 36 grams, or about 1 $\frac{1}{4}$ ounces.

The child's weight should be doubled in the fifth month, and trebled in the twelfth month. The baby should be able to hold up its head in the sixteenth week, at the same time sitting up. It should stand by the thirty-eighth week. It should "take notice" and be able to grasp things by the third to the fourth month.

It is important that a nurse should know the above

facts as to the child's development, to be able to report satisfactorily concerning its condition to the physician in attendance.

Sleep.—A large proportion of the time of early infancy is spent in sleep. The more premature the baby, the more constantly does it sleep. During sleep the eyelids should be tightly closed. A partial separation of the lids, showing the whites of the eyes, is an indication either of some disease, or of pain, from whatever cause.

The Respirations of a healthy baby when awake may be very irregular, some inspirations being shallow and others deep—at times hurried, and again slow. The only time when the respirations can be satisfactorily counted is when the child is asleep, for then the breathing is more regular. The rise and fall of the abdomen may then be noted (for the breathing of an infant is abdominal). The number of respirations in a minute averages 44. So quiet is the healthy breathing of early infancy that there is no motion of the nostrils or of the lips, or even of the chest, to indicate the incoming and outgoing of air. Fever, colic, and lung trouble will greatly increase the number of respirations in a minute, making them mount up to 60 or 80, or even higher. Nervous excitement has a similar effect, though this is temporary.

In brain trouble a slowing of the respirations occurs, so that they may get down to eight in a minute. When the act of breathing is painful, a moan or cry accompanies

each act of respiration. The expansion of the nostrils with each inspiration indicates a want of sufficient air space in the lungs. In connection with any lung trouble a *bluish coloration* of the lips and face generally is a bad symptom, as it indicates that sufficient air does not enter the lungs to purify the blood.

The Pulse.—Little reliance is to be placed upon the pulse of a baby as indicative of disease, for it is characteristic of the infantile pulse that it is very rapid, very easily affected by external or internal causes, and notably irregular. The average pulse of the new-born baby is 140. If a baby is well-nourished, it is too fat to enable the pulse in the radial artery to be counted. Hence the pulse is more easily obtained in the temple or at the ankle. If not thus readily obtained, the heart-beats may be counted by holding the hand over the baby's heart.

The Temperature of a child at this age is also subject to rapid changes, the result of slight causes. The average temperature is 99° Fahr., but a cold or an attack of indigestion may cause a sudden increase, with as sudden a return to normal when the cause is removed.

A *subnormal temperature* is an indication of lowered vitality, the result of some drain upon the system, as of an exhaustive diarrhea, or of some constitutional weakness. This fall of temperature is a dangerous symptom in infants. The tip of the nose and the extremities of the child, if cold, also indicate a condition of low vitality and require that the child should receive very especial

care from the nurse as to the supply of food and warmth. In fever the back of a child's head feels very hot, as also do the palms of the hands.

The Cries of a Child form a special language by which its needs may be made known. Every nurse should learn to distinguish the peculiarity in the different kinds of cries, so as to meet the varying demands thus indicated. A healthy, well-trained baby rarely cries, unless *hungry*, when the cry will be constant and very persistent until the want is satisfied; the upper part of the body is moved at the same time, especially the arms and head. The cry induced by *ear-ache* is also unappeasable, and generally accompanied by a drawing of the hand up to the head. A similar gesture accompanies the cry induced by *brain trouble*, which is a shrill scream, often waking the child during sleep.

A *cry accompanying a cough* is an indication of pain in the chest. The paroxysmal character of *colic* is indicated by the characteristic cry which accompanies it,—a sharp, sudden cry,—the limbs at the same time being drawn up toward the abdomen. An evacuation of the bowels may precede or follow the cry.

Sore Mouth.—If, in nursing, a baby seizes the nipple by the month and drops it suddenly with a cry, doing this repeatedly, there is in all probability some soreness of the mouth, which should be discovered and treated. However heartrending the cry, the baby does not secrete tears in sufficient quantity to run down the cheeks until the third month of infancy. Hence the common saying

that a baby cannot suffer pain because it sheds no tears while crying is not supported by fact.

Facial Expression.—A wrinkling of the forehead vertically, produced by drawing the eyebrows together, indicates pain about the head. A sharpening or play of the nostrils exists in lung troubles. A drawn look about the mouth is found with digestive troubles, as flatulent colic.

The Stools of a very young baby fed on breast milk should be of a yellow or orange color. Three or four evacuations a day are natural. They should contain no curds. Stools of bottle-fed babies are lighter, more offensive and less frequent.

Urination.—The number of times a new-born baby urinates will vary much with the weather and the conditions under which the child is placed. It is not unusual in cold weather for the napkin to need changing almost every hour. Healthy urine should not stain the napkin.

Mothers and nurses are often much troubled by the failure of an infant to pass urine or feces for the first few hours or days of its life. A careful examination of the anus or external opening of the bowel will soon show whether there is any imperforate condition of the rectum which may cause the retention of feces. Closure of the urethra is so rare that retention of urine is very seldom seen.

The new-born infant secretes but very little urine until it begins to take nourishment freely. The bladder is usually emptied during the process of birth, which is

very frequently the case with the bowels, so that if the child seems well and there is no malformation of the parts, the family may be assured that the condition is only temporary.

The use of fomentations over the kidneys and bladder will frequently hasten the evacuation of urine if it be unduly delayed. If the secretion seems highly concentrated, as is shown by the brickdust deposit sometimes found on the baby's diaper, a drop of sweet spirits of nitre in a teaspoonful of water may be given once in two hours.

Should the child seem to suffer pain from the retention of the contents of the bowel, an ounce of warm water or olive oil injected into the rectum will usually produce a satisfactory evacuation. Should a laxative by the mouth be needed, the physician must be consulted. A teaspoonful of sweet oil often serves the purpose very nicely, or a few grains of manna dissolved in milk.

The Teeth sometimes appear prematurely. A child may be born with one or more teeth already cut. These are usually imperfect, and fall out in a short time, to be replaced by the milk-teeth. The latter are twenty in number, and are usually cut in groups, starting about the fourth month and continuing till between the twentieth and thirtieth months, when the first dentition should be complete. There is an interval of rest as a rule between the eruption of each group. Girls are more apt to cut their teeth early than boys, and, as an early

dentition is usually an easy one, it is fortunate for the child to have it occur early.

Even under normal conditions the edges of the gums in teething become swollen, rounded, and reddened as the teeth come near the surface. The saliva is at the same time increased in quantity, and the mouth is heated and uncomfortable, so that the child desires constantly to bite upon any object that may be at hand. A healthy child should not suffer in any way from the process of dentition, and when the point of the tooth comes through the gum the local symptoms may vanish.

The following diagram will illustrate the order in which the teeth are cut. The numbers 1 to 5 show to how many groups the several teeth belong and the order in which the groups appear. The letters *a* and *b* show the order in which the teeth in each group appear.

Bottle-fed babies are more apt to be late cutting their teeth than those that are breast-fed. If no teeth have appeared when the child is a year old, we may know that the child's general nutrition is at fault, or it may have the disease known as rickets.

Bottle-fed babies are also apt to have their teeth come through the gum in irregular order. This frequently is an indication of lack of health, although sometimes it is a family peculiarity.

The first set of teeth which the child has is called the temporary set. It consists of twenty teeth, known as milk teeth. The permanent set, of which the first appear at about six years of age, consists of thirty-two

teeth. They push upward in the jaw and loosen the first set, gradually displacing them.

Walking.—Many children creep before they walk, and in that case may prefer this means of locomotion to walking. A child usually creeps as early as seven or

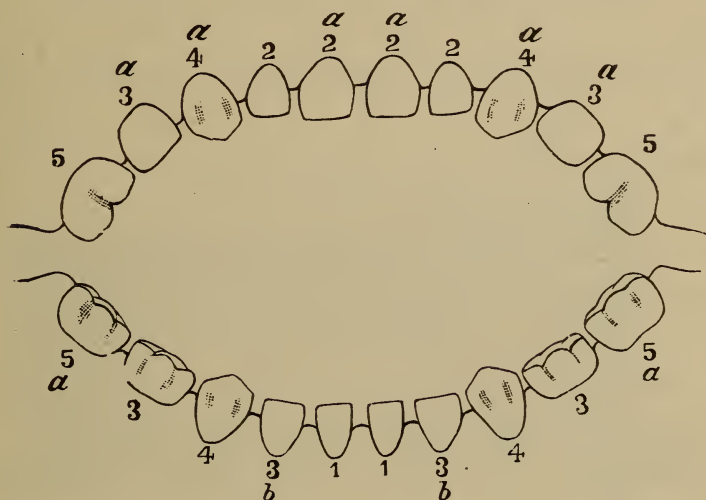


FIG. 53.—DIAGRAM SHOWING ERUPTION OF MILK TEETH.¹

1, 1. Between the fourth and seventh months. Pause of three to nine weeks. 2, 2, 2, 2. Between the eighth and tenth months. Pause of six to twelve weeks. 3, 3, 3, 3, 3, 3. Between the twelfth and fifteenth months. Pause until the eighteenth month. 4, 4, 4, 4. Between the eighteenth and twenty-fourth months. Pause of two or three months. 5, 5, 5, 5. Between the twentieth and thirtieth months.

eight months. At about ten months the child may walk by holding on to things. Strong children may walk alone at one year of age. With weaker children this may be delayed until two years.

¹ From Starr, "Diseases of the Digestive Organs in infancy and Childhood."

CHAPTER XVII.

THE AILMENTS OF EARLY INFANCY.

It is not proposed in this chapter to take up all the ailments of infancy, for the term *infancy* comprises a time beginning with the birth of the child and lasting until the first dentition.

The obstetric nurse remains with the patient from four to six or eight weeks. During this time many deviations from the normal, healthy state may be met with in the child, and these she should be quick to observe and know how to manage.

Prematurity.—One of the most important conditions of this period is “prematurity,” a result of the too early birth of the child.

A premature birth is one that occurs at any time after the child is “viable”—that is, capable of living after its birth. The term of *viability* has been set at twenty-eight weeks, or seven lunar months. Deliveries occurring previous to this time are called “miscarriages.”

It may be that, with improved methods of management, the period of viability may be placed at an earlier date, but this is as yet a matter for proof.¹

¹ The French claim that by means of gavage and the couveuse, or hatching-cradle, the actual period of viability has approached six months of intrauterine life.

It has generally been conceded that a child born at six lunar months cannot live, that at seven months it stands little chance, that at eight months its chances are better, and at nine still better.

The popular notion that an eight-month baby (counting the calendar month) does not stand so good a chance of living as a seven-month baby is altogether wrong. Great care is needed for premature babies.

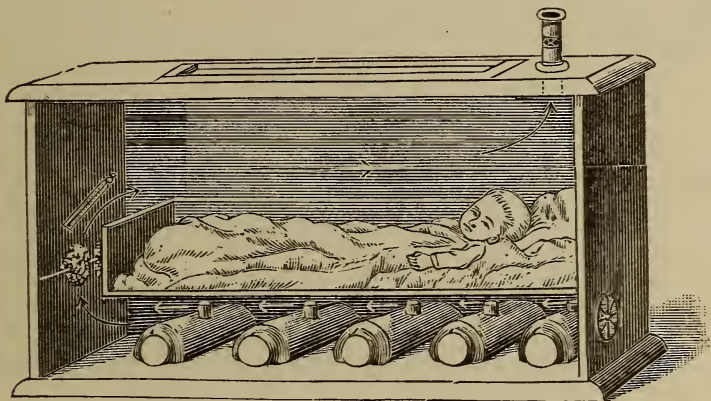


FIG. 54.—TARNIER'S COUVEUSE.

Dimensions of couveuse for a single infant: Width, 36 cm.; length, 65 cm.; height, 55 cm. For twins a larger case is necessary. The temperature within the incubator should be kept at from 85° to 95° Fahr., as determined by a thermometer laid in upper compartment.

They especially need regular feeding and to be kept very warm. The skin, being thin and delicate, will also require very careful attention.

Until within a few years the matter of keeping the baby sufficiently warm was exceedingly difficult to manage. The French invention of the "couveuse," or "brooder," has simplified the matter very much. The

first incubator for the rearing of premature infants was made in 1857, at Bordeaux. It was crude in construction as compared with more modern inventions, but yielded very satisfactory results. In 1880 Professor Tarnier, of Paris, constructed an apparatus, consisting of

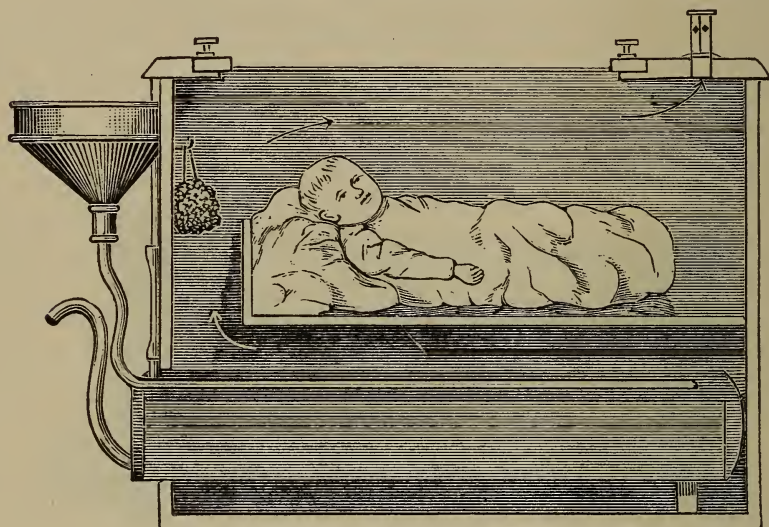


FIG. 55.—AUVARD'S COUVEUSE (INTERIOR VIEW).

In Auvard's couveuse a cylindrical reservoir of metal takes the place of the hot-water jars in lower compartment of Tarnier's couveuse. This is filled by means of a metallic funnel fastened to one end of the box and communicating with the cylinder. An overflow pipe carries off the excess of water upon the addition of more hot water as required.—“*Archives de Tocologie.*”

a box with an upper and a lower chamber, which communicated with each other, and which was heated by stone jars filled with hot water in the lower chamber, the upper serving as the bed for the child. Suitable means for regulating the degree of heat were provided by ventilators, etc. Dr. Auvard later improved this incubator

and presented it to the Maternity Hospital at Paris, where it served to prove most successfully that artificial means could be employed for increasing the chances of life with premature infants.¹ In 1891 M. Lion, of Nice, improved upon any of the forms of apparatus earlier devised, and achieved the most wonderful results by his invention, which is now much used.

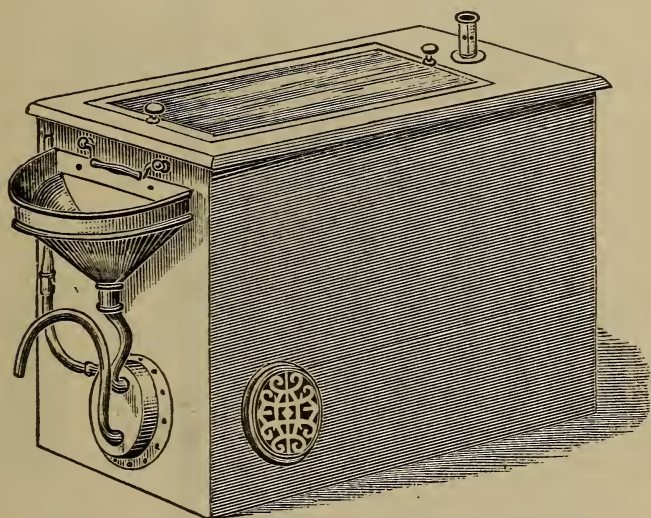


FIG. 56.—AUVARD'S COUVEUSE (EXTERIOR VIEW).

The Lion Incubator.—“The Lion incubator is composed entirely of metal and stands upon iron supports. It can be disinfected without deterioration by means of a steam stove under pressure. Ventilation is obtained by means of a tube of about three inches in diameter, with

¹Crede's incubator is a copper vessel with double walls, between which water at the desired temperature may be kept, and withdrawn by means of pipes and stop-cocks.

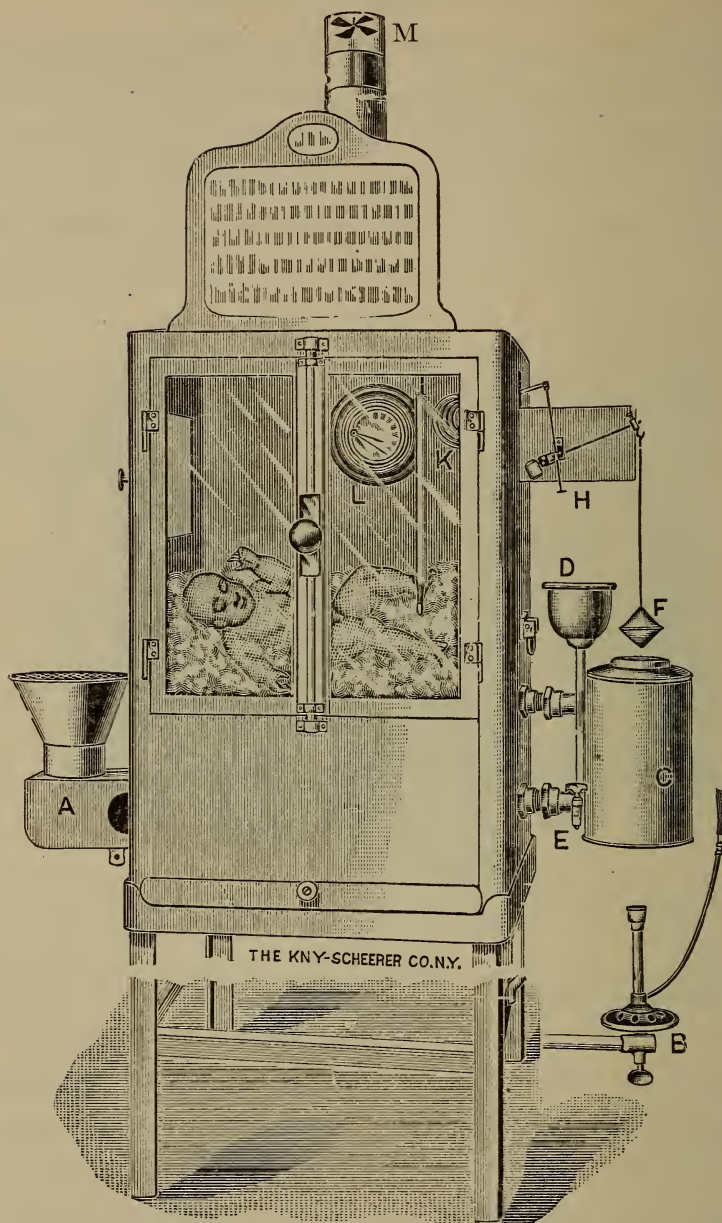


FIG. 57.—INCUBATOR FOR PREMATURE-BORN CHILDREN.¹ (*Kny-Scheerer Co., New York.*)

a chimney of the same size. A screw placed on the top indicates by its rotation the strength of the current of air. The front of the incubator is fitted with a glass window, through which the child may be seen, while on the left is another glass window, which enables the mother or nurse to attend to the wants of the infant, and, if necessary, to remove it. The baby is laid in a metallic hammock placed in the center of the incubator, thus enabling the warm air to circulate freely about it. A thermometer placed at the level of the infant's head regulates the working of the apparatus. The heating is effected by means of a siphon, through which the hot water circulates, and which communicates with a reservoir at its side. A special system of pipes allows the air to pass directly from the exterior into the apparatus. In these pipes the air is filtered before it enters the incubator. The temperature is automatically regulated,

¹The apparatus is constructed of steel, with glass doors and one glass window on the side for feeding purposes, etc. The heat generated in C communicates itself to the water-filled tubes on the inside, maintaining a uniform temperature at any desired point by means of a spiral thermo-regulator inside, K, which is controlled by micrometer adjustment from outside, H and F. The hygrometer, L, records the atmospheric conditions of the chamber. The air supplied to the infant is filtered through an absorbent cotton filter in box A; this air can be taken from the room in which the apparatus is placed or directly from the outside by means of simple tubes. The revolving wheel, M, in chimney indicates the perfect circulation of air. The cup D is a feeding reservoir for the supply of water circulating in the pipes, and communicates with the siphon at the point E. When the apparatus is in active use the cup will need filling about once in three hours. The gas-burner B is connected with a gas pipe in the apartment in which the apparatus stands, either by rubber tubing or, preferably, by close metallic connection. A thermometer is fastened to one side of the upper compartment of the apparatus. A frame for a chart containing records of the condition of the child is found on the top of the apparatus.

and the current of heat is increased or diminished as required, and without variation.¹”

Modifications of the Lion incubator are made in this country. The accompanying cut shows the one in use at the Maternity connected with the Woman's Hospital.

The child should be placed in the upper compartment of the *couveuse* as in its cradle, being removed simply for nursing, its bath, and toilette. If artificially fed, it can be managed through the side window, without removal from the incubator. When removed from the *couveuse*, care should be taken to have the temperature of the room sufficiently warm. It should be as nearly as possible the same as the temperature within the *couveuse*—between 87° and 90° Fahr.

Auvard recommends the use of the *couveuse* in all cases where the vitality of the child is enfeebled either by external causes, as cold, or internal causes, as prematurity, congenital feebleness, cyanosis, or “blue disease” wasting, or other general maladies enfeebling to the newborn.

Swaddling.—Before the *couveuse* was known, premature babies were *swaddled* in cotton, in order to be kept sufficiently warm. The directions for doing this are as follows:—

Take a square baby-blanket and place it diagonally on the table or bed. Turn down one corner for four inches' distance to come up over the baby's head. Spread over this blanket a lap of raw cotton. Have the

¹From Catalogue of Lion Institute, Paris.

baby's napkin and binder on, and a flannel undervest. Make a cap out of the cotton, fitting it over the baby's head and bringing it down well under the chin. Then roll the baby up in the cotton lap. Bring the blanket around this firmly, so as to hold it; the portion of the blanket on the baby's right being brought over and tucked in on the left side, the portion on the left being correspondingly folded over toward the right. The corner of the blanket left at the feet is then folded up over

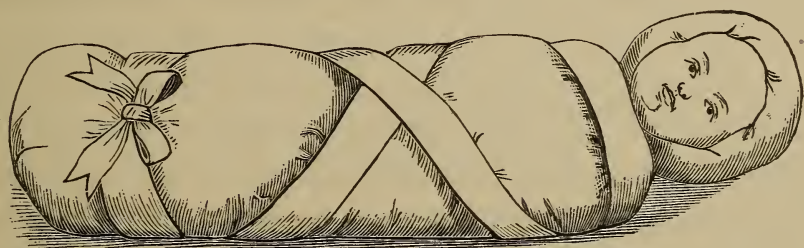


FIG. 58.—SWADDLED BABY.

the front, and the whole held by means of a strip of muslin bandage or ribbon. The bandage is first applied beneath the chin, crossed under the back, and again crossed in front, the ends being brought forward to fasten in a bow-knot at the feet.

The great disadvantages of this method may be seen in the restriction it gives to the movements of the child's limbs, and the difficulty of determining when the child's napkin needs changing, also the frequent exposure of the child during these changes to the ordinary atmosphere.

Home-made Incubator.—An ingenious method of maintaining the body-heat of a baby, and one readily

accomplished in any household, is described as follows by Dr. Reynolds:—

“A large basket should be thickly lined with heated blankets or other flannels. A number of bottles, filled with very hot water, should be so arranged around the sides of the receptacle that they can be removed and re-inserted without disturbance of the infant. The child is wholly covered, with the exception of its face, with well-warmed cotton batting, and is laid between the bottles; and the cradle is then covered with a thick blanket, a space at the end which corresponds to the child’s head being left open to permit the entrance of air. A thermometer should be laid beside the child, and one or more of the bottles should be refilled with hot water whenever the temperature is seen to fall below 87° F. The water should not, on the other hand, be so hot as to raise the temperature of the contained air much above 90° F.”

Care of the Incubator Baby.—As soon as the cord is cut, the premature infant should be rapidly oiled with *warm* olive oil, wrapped in lamb’s wool or absorbent cotton and placed in the warm incubator (87°–90°). Feed the child every hour through the window of the incubator; after each feeding, inspect the wool under the genitalia and change, if soiled; carefully change the position of the child from one side to the back, from the back to the opposite side, and so on regularly each hour, as there is danger of collapse of the lung from lying too long in one position. Always keep the child’s face towards the window of the incubator.

Constantly watch the temperature of the incubator and the revolving disk which shows the free circulation of air. *Never* leave the incubator immediately after turning up the gas flame which regulates the temperature, for this may rise very rapidly and the infant may die from overheating.

For the first week or sometimes longer, the infant must not be removed from the incubator for any purpose. On the fifth day, change the dressings on the cord using every aseptic precaution for these infants are prone to septic infection of the cord. After one week if the child thrives, it may be removed from the incubator for a daily dip in hot water (103°) followed by careful drying of the surface with a warm, soft towel. The skin under the arms, in the groins and around the genitalia must be mopped dry rather than wiped for there is great danger of abrading the delicate surface and subsequent infection. After drying, oil the body rapidly with equal parts warm olive oil and whiskey. Weigh the child every other day. By this time the child may wear a one-piece garment of flannel.

Collapse of the lung—atelectasis—with death from asphyxia is a chief factor in the high mortality of premature infants, hence any evidence of cyanosis or arrest of respiration must be reported to the physician at once. Stimulation may be ordered—a drop or two of brandy with or without a drop of aromatic spirits of ammonia, in a teaspoonful of warm water every hour or two; a hot bath followed by artificial respiration and

electricity may be required. A tank of oxygen should always be at hand.

Period of Incubation.—The length of time a premature baby should be kept in its close quarters is dependant upon the progress it makes, or *until the gain in weight and strength brings it up, as nearly as possible, to the standard of a baby at full term.* A seven-months child, if strong enough, may be dressed and allowed to nurse when it is four weeks old. Great care, however, must continue to be exercised until the child reaches full term. It should not be removed permanently until it has acquired sufficient vigor to live in the ordinary atmosphere of the apartment. To accustom the child to this atmosphere, it should, as it grows stronger, be removed for an hour at a time from the couveuse during the warmest part of the day.

It is best to continue the use of the apparatus at night for some time after the child becomes accustomed by day to removal from the couveuse, for the danger of chilling from changes in the atmosphere is greater at night.

The child should be *fed* every hour. As it is usually too weak to suck, it is safer to feed the baby with a spoon or with a dropper, to make sure of its obtaining a sufficient amount of food. From one to two teaspoonfuls should be given every hour. Make sure that the milk is actually swallowed; gentle stroking of the muscles at the sides of the throat may stimulate swallowing efforts where they are sluggish.

Breast milk is, of course, the best. It may be drawn from the mother's breast and fed to the child while warm. The nurse should introduce her little finger into the child's mouth and allow the milk to trickle slowly down the finger, so as to enter the mouth drop by drop, while the child sucks the finger. Should the mother have no milk, the first week's feeding recommended previously, or sterilized peptonized milk, diluted two-thirds with boiled and filtered water, may be used—if no wet-nurse can be had as a substitute.

Gavage.—Should the baby drink badly and vomit a large proportion of the liquid given to it, "gavage" may have to be resorted to. The physician must authorize the nurse to carry this out, for she should never undertake it otherwise. The directions for practicing gavage, as given by Dr. Louis Starr, are as follows:—

The apparatus used is quite simple, being nothing more than a urethral catheter of red rubber (Nos. 14-16, French), at the open end of which a small glass funnel is adjusted. The infant upon whom gavage is to be practised is placed on the operator's

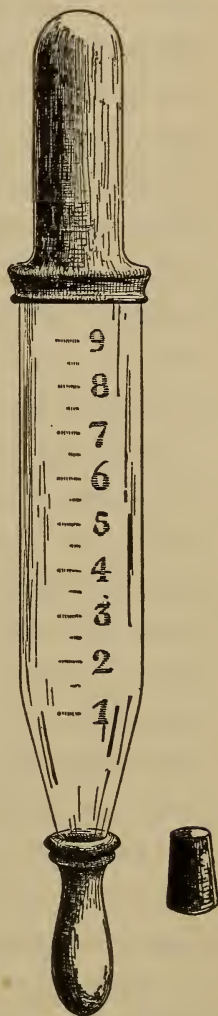


FIG. 59.—FEEDER FOR PREMATURE INFANTS. (Cooke.)

knee, with its head slightly raised; the catheter, being wet, is introduced as far as the base of the tongue, whence, by the instinctive efforts at swallowing, it is carried as far down as the esophagus (or gullet) and into the stomach.

The liquid food is next poured into the funnel, and by its weight soon finds its way into the stomach. After a few seconds the catheter must be removed, and here is the great point in the operation; it must be removed with a rapid motion and at once, for if it be withdrawn slowly all the food introduced will be vomited.

Mothers' milk is the best for gavage, as at any time, but other kinds of food may be used. The amount given and the number of meals will vary with the age and strength of the child. From a teaspoonful to a dessertspoonful at one time is sufficient for a very young child, given every hour. Too much food would produce indigestion. As the child grows stronger this mode of feeding may be made to alternate with nursing. Modified cow's milk may be used for the alternate feedings.

Colic is a very troublesome affection of infancy. It corresponds to the dyspepsia of grown people, and indicates that the food is either improper in quality or quantity. A colicky cry is a sudden, sharp cry, the baby drawing up its feet and legs at the same time. The feet are generally cold, and one indication for treatment is to warm them; warm socks or woollen stockings should be worn or hot bottles applied to the feet.

The abdomen should also be kept warm by the application of *heated flannels*, or a spice poultice, wrung out in hot whiskey, or a flaxseed poultice, which should be kept applied until the baby gets relief.

To make a *spice plaster*, a teaspoonful each of ground allspice, cloves, cinnamon, ginger, with four teaspoonfuls of flaxseed meal, may be quilted into a bag of flannel, 4 x 8 inches, which will fit entirely over the baby's abdomen. When the spicy smell is lost the plaster is no longer good for use.

Warm oil rubbed gently in over the abdomen for ten to fifteen minutes at a time will often give relief by leading to the expulsion of the wind causing the pain.

If the application of heat is not sufficient, *anise-seed tea* should be given. It is made as follows:—

Over a half-teaspoonful of anise-seed pour a half-teacupful of boiling water. Allow it to steep a few minutes, until the water tastes strongly of the anise-seed. A half-teaspoonful of this may be given warm every ten minutes until the baby has had four doses. This brings up wind from the stomach, and thus gives relief. Simple hot water will help in the same way should anise-seed not be on hand. *Catnip tea* may be made and used according to the same directions. These teas are preferred to the drop doses of gin so frequently given.

Bowel Movements.—Frequent stools do not always indicate diarrhea. For the first six weeks of its life

a child averages three or four movements every twenty-four hours, after which it has about two a day until it is two years old.

A natural passage for an infant would be of a mushy consistency and a yellow or orange color. It should contain no curds larger than rice grains. Bottle-fed babies have whiter and more offensive stools than breast-fed babies.

Diarrhea.—In diarrhea there is a change in consistence or appearance. A liquid stool or one colored green or white or like putty, would be abnormal. The presence of curds also would show an inability to digest the food properly. The diarrheas of infancy, though oftenest due to improper food, may be caused by exposure to heat, or may result from taking cold. Bottle-fed babies suffer much with diarrhea in summer time, indigestion and heat acting together to produce the disease. Often little can be accomplished without entire change of air. A trip to the seashore or the mountains has saved many a baby's life.

In *simple diarrhea* there is little, sometimes no, fever. There may or may not be vomiting. In *cholera infantum* the stools are very numerous, the discharges being the color of rice-water. There is constant vomiting, high fever, intense thirst, great coldness of the surface, and often sudden collapse.

In *inflammation of the bowels* the movements are smaller and have some color. The fever is more moderate and the vomiting is less.

In *dysentery* the passages are frequent, small, and contain more mucus. There is much straining and often quite a large amount of blood passed. The emaciation of infants suffering from these diseases is very rapid.

The careful regulation of the baby's diet is the most important consideration in *treatment*. Stop all milk for forty-eight hours. A little barley-water or egg-albumen water, or some simple meat juice may be used if the baby seems hungry. Cold water also may be given. If the baby's skin feels hot, it may be bathed or sponged with cool water frequently. If the surface is cold, a tepid mustard bath may be given. When the attack first begins it is well to clear the bowel of all irritating substances by a dose of sweet oil, to which (for an infant under two months) 15 drops of castor oil may be added. After this a little bismuth and chalk mixture is usually given by the physician, or small powders containing bismuth (about 1 gr.), once in two or three hours. The physician will usually determine the special remedy indicated after inspection of the stools.

Feeding in Indigestion.—If, therefore, curds exist in the stools, or the matters vomited be curdy, the indication would be to use some alkali or a small quantity of some thickening substance, as barley-water, or gelatin, or the milk may be peptonized.

Lime-water is the alkali most usually employed. Lime-water contains but about half a grain of lime

to the fluid ounce of water, so that at least a third of the feeding should be lime-water where it is used to correct indigestion. To make lime-water, a piece of lime about the size of the fist should be placed in an earthen vessel; about three or four quarts of water may be poured over this, strained thoroughly, and then allowed to settle. The water should be used only from the top of the vessel. It is better to filter it before use. The vessel may be kept filled with water so long as any of the lime remains in it, when dissolved it will be necessary to add more lime.

When lime-water cannot be obtained, a small powder of baking soda—three or four grains—may be added to the nursing-bottle. These rules apply when the baby is artificially fed. Should the baby be nursing from the breast, a teaspoonful of lime-water mixed with an equal quantity of boiled and filtered water may be given it before it is put to the breast each time.

Barley-Water and Oatmeal-Water.—Of the thickening substances used to help in the digestion of food barley-water is one of the best. To make barley-water, a gill of boiling water should be poured over a teaspoonful of washed pearl barley, finely ground in a coffee-mill. Boil for a quarter of an hour, then strain. It should be mixed with milk in the proportions required, two-thirds, a half, or one-third. A pinch of salt should be added to the mixture. Oatmeal-water is similarly made.

Gelatin is sometimes used instead of barley-water.

A piece an inch square of plate gelatin is put into a half tumblerful of cold water and allowed to stand about three hours. This may then be turned into a teacup and set in a pan of hot water and boiled. The gelatin thus dissolves, and when allowed to cool forms a jelly, of which one or two teaspoonfuls may be added to a feeding.

Infants' Foods.—Of the various kinds of “infants' food,” those in which the starch has been made into dextrine or grape sugar are the best. “Mellin's Food,” “Horlick's Food,” and “Eskay's Food” belong to this class. A teaspoonful of any of these dissolved in a little hot water—about a tablespoonful—may be added to the milk for the feeding. Special directions for the use of each are supplied by the manufacturers with packages of the food. These starch foods cannot be well borne by a child before it is five or six months old, as a rule, because the secretion of saliva is necessary to the digestion of starch.

Condensed Milk contains a large proportion of sugar, hence tends to make fat. It is not so nourishing as many other forms of food. Babies fed on it, though large, are generally far from strong, and are very apt to suffer from indigestion.

Usage in Woman's Hospital.—A careful regulation of the diet for the early weeks of infancy, with the addition of barley-water, lime-water, or gelatin, as indicated in place of plain water, has been found most satisfactory in the care of infants in the Woman's Hospital.

The use of water alone as a diluent is preferred. The modified milk preparations of the Walker-Gordon laboratory in Philadelphia have also been used with great satisfaction.

When curds are persistently found in the stools, especially with older children, it is thought by some to be of advantage to slightly thicken the milk by the addition of a little prepared wheat flour, barley, oatmeal, or Graham flour. *The use of cereals for the purpose, however, is rather questionable, especially with young infants.*

Flour Ball.—In using wheat the following recipe may be employed: Tie a pint of dry wheat flour into a piece of stout muslin and boil nine hours; scrape off the outer crust and the inside will be found to be a dry ball; grate this as needed and add about two teaspoonfuls to a pint of water, which when boiled may be used in diluting the child's milk in the proportion desired, instead of using plain water. After the sixth month, four teaspoonfuls may be used in place of two. Dr. J. Lewis Smith recommends allowing the flour, tightly tied up in a bag, to stand under water for about a week, the water being allowed occasionally to boil during this time. The flour is thus rendered more digestible.

Other Cereals.—Ground barley, oatmeal, or Graham flour may be boiled in water in the proportion of a dessertspoonful to the pint. An equal quantity of milk may be poured in while the water is boiling, and the whole may be boiled together from about twenty minutes to a half-hour and then strained. A pinch of salt

should always be added. An ounce of cream and a little milk sugar may be added to this. Dr. Keating recommends this preparation as excellent for an infant after its fourth month, when he considers that it is best to make the use of the bottle alternate with the breast in the feeding of an infant, especially if the mother is not very strong.

Weaning.—If the mother has substituted the bottle for some of the feedings as early as at the age of six months, the child will not suffer from the process of weaning. In fact, a child often weans itself, refusing to take the breast milk during the later months. The mother's milk, even in most favorable cases, is rarely sufficient nourishment for the child after it is a year old. If possible no change in the child's food should be made in the summer months.

Substitutes for Milk.—When the child is very weak and vomits constantly,—milk, especially, seeming to disagree with it,—some of the following measures may be resorted to: small and repeated quantities of barley-water, gum-arabic water, or wine-whey may be used, a teaspoonful every half-hour or hour; sometimes the white of an egg may be shaken up in a bottle of warm water and a couple of grains of lactopeptin or Fairchild's *liquor pancreaticus* may be added, with a little milk sugar, and this may be given the child in teaspoonful doses. As the child's stomach grows stronger, teaspoonful doses of peptonized milk may be tolerated. No child should be fed too contin-

uously on the prepared foods alone. Fresh milk should be used whenever possible, as a disease known as scurvy often arises from long use of stale preparations. The admixture of cream with water (1 part to 5 or 6 of water) has already been referred to as a substitute when milk is not well borne.

An occasional *drink of water* is essential to a baby, however young. The water should be boiled and kept air-tight to be free from germs. From a teaspoonful to a tablespoonful may be given occasionally during the intervals of nursing. Infants under four months of age should be fed upon milk alone in some of its forms.

Milk Foods.—When breast milk cannot be had and cow's milk seems persistently to disagree, some of the "milk foods," as Carnrick's Soluble Food, Anglo-Swiss, Gerber's, or American Swiss, should be tried first before any preparation containing starch is used. Care must be taken to see that the preparations are fresh before using.

The Farinaceous Foods, as Blair's Wheat, Hubbell's Wheat, Imperial Granum, and the home-made preparations before described should not be used until the child is at least four months old, if at all.

Liebig Foods.—If in the use of farinaceous food the child's bowels become constipated, or it suffers from colic, or is restless at night and loses its appetite, some of the Liebig foods may be tried, as Mellin's Malted Milk, Lactated Food, etc. The directions for the use

of these foods come with the various packages containing them, and are readily followed. Milk, as a rule, in some form or other, should be used in making up these preparations; otherwise they will not contain sufficient nourishment.

Constipation is not an infrequent occurrence in infancy. Its management consists principally in the use of mechanical irritants for stimulating the bowels; thus, a soap suppository, an injection of warm oil or water, gentle friction over the bowel, especially following the direction of the large bowel from right to left, are among the most effective methods for overcoming this condition.

The soap suppository is made by taking a piece of Castile soap, about one inch long, and shaping it into a cone and making it very smooth, so that it will not be larger around than the end of the little finger. This should be gently insinuated about half its length into the bowel and held in the opening until it excites the bowel to act.

The bowel injection may be given by means of the single-bulb syringe, known as the "eye and ear syringe." The bulb holds about two tablespoonfuls of liquid. This may be warm cotton-seed oil, sweet oil, or warm water. The nozzle used should be small, smooth, and

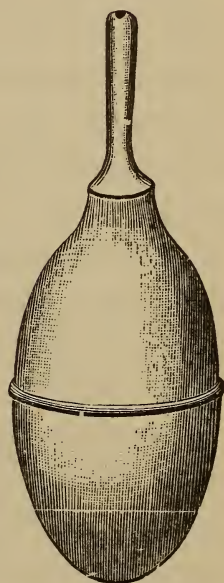


FIG. 60.—SINGLE-BULB SYRINGE.
(Starr.)

well oiled. It should be very carefully introduced into the bowel, being directed a little to the left side, and the bulb gently squeezed to force the contents into the bowel. It is best that the liquid should be retained for a little time before it is forced out. The keeping up of a slight pressure over the entrance to the bowel for a short time will aid this.

Rubbing the abdomen for about ten minutes (either with or without oil) in the direction of the large bowel—that is, upward on the right side as far as the border of the ribs, then across to the left side and down this to the pelvis, is often efficient in overcoming constipation.

Of Medicinal measures, glycerin, gluten, or cacao-butter suppositories may be resorted to, or manna may be given; a piece the size of a pea in the child's milk one, two, or three times a day, or a spoonful of water sweetened with dark-brown sugar. Should the child be fed on artificial food, oatmeal water may be substituted for barley-water in the preparation of the food. If nursing, oatmeal water may be given it (1 tablespoonful) before each nursing.

Rupture, or Hernia, is a protrusion of the bowel through some weak point in the abdominal walls. It very often occurs at the navel and sometimes in the groin. The best treatment for the former consists in drawing together the edges of the hernial opening by means of a strip of adhesive plaster. A truss will need to be fitted for the other form.

Vomiting.—Babies vomit very easily, because their stomachs are placed more vertically in the body than when they grow older, and overfeeding will cause them to bring up the amount in excess of what the stomach can hold. This vomiting is, of course, not serious. Should the vomited matter be sour and curdy, the child seem to suffer from nausea, weakness, or fever, it indicates a condition of *indigestion* which should receive attention. The management would largely consist in the regulation of the quality and the quantity of the food, as has just been said. It is best to withhold food for several hours, and modify its character when it is resumed, as described above. A spice-plaster over the stomach is often helpful. When the vomiting is due to overeating, the amount of food taken at one time must be regulated.

Worms.—There are three different kinds of worms which may exist in children, but young infants are troubled, as a rule, with one kind, the *thread* or *seat-worm*. These look like little pieces of white cotton thread, and the stools should be carefully examined when suspected. They make the parts around the lower bowel very sore and produce intense itching. The parts should be kept very carefully cleansed, and a bowel injection of salt and water or of a little infusion of quassia may be given every day or so.

The tape-worm and round-worm are found in older children.

Thrush is a disease due to want of care of the baby's

mouth. If milk be allowed to collect on the tongue, it sours, and the presence of this acid favors the development of thrush, which is really a vegetable parasite. White patches may be seen on the soft palate, inside the cheeks, lips, and tongue. The attempt to rub off these patches causes bleeding. Gastric catarrh and diarrhea usually accompany this trouble. Care in cleansing the child's mouth after each nursing will prevent the occurrence of thrush. Its treatment consists in the use of an alkaline wash, as borax and water (twenty grains to the ounce), or some antiseptic wash prescribed by the physician.*

Birth Marks—that is, the purplish-red patches or the moles sometimes found on a new-born baby—are not dependent in any way on the mental impressions of the mother. They can often be removed by treatment.

Red Gum is an eruption which comes out over the baby in the first or second week of its life. Sometimes these little points of elevation on the skin are *white*. The eruption is then called "white gum." These eruptions are due to changes in the skin and irritation from exposure to air, and are not serious. They rarely last over a week, although they may persist for several weeks in babies of delicate skin or poor digestive powers. They are also known as *strophulus*.

*Boric acid (ten grains to the ounce of water) is very good. A teaspoonful of this may be swallowed by the child occasionally. Of late a solution one part hydrogen dioxide to eight of water has been much used. This followed by the boric-acid wash. After which a little bismuth subnitrate may be applied over the sore spots.

Blisters.—The occurrence of little blisters on the child's body, especially on the palms of the hands and soles of the feet, is a matter of more moment and should at once be brought to the attention of the physician, as also should sores around the finger nails. These indicate a condition of the blood for which the use of remedies prescribed by the physician will be necessary. The technical name for the rash is *pemphigus*.

Prickly Heat, or Miliaria, consists of pin-head sized red elevations closely crowded over the portions of the body where there is most perspiration. It often results when children are too warmly dressed, or in hot weather. The treatment consists in the substitution of lighter clothing, with the relief of the skin irritation by the use of some powder, as camphor, one part to eight parts powdered starch. A little magnesia may be given by mouth.

Stomach Rash is a name given to an eruption known as *erythema*—a redness of the skin, with the occurrence of *pimples*—caused by indigestion.

Eczema is a disease which is much more troublesome. It may last months. There is usually an inherited tendency to some constitutional trouble; or improper food (especially starchy foods) or imperfect hygiene may be responsible for it. The surface is swollen, red, and moist; thick crusts often form. There is intense itching. Such cases should always be under the care of a physician. A saturated solution of salicylic acid, with the subsequent application of zinc

ointment, often greatly relieves the distressing symptoms, and in time removes the rash.

Milk Crust consists of large, yellowish patches on the head, and is really dandruff. Castor-oil should be used to remove the patches, and the head kept cleansed with borax and water.

The Whites.—Sometimes a whitish, glairy discharge comes from the privates of little girl babies. This is simply the matter found there at birth. Occasionally a little blood may be mixed with it, the result of an abrasion in the vagina, and may last a day or two. The nurse need not be afraid to remove this matter; in fact, if left, it causes irritation of the skin.

Suppression of Urine.—A healthy baby usually wets its napkin very frequently—it may be every hour during the day, and four or five times at night. Sometimes several hours may pass and yet the napkin remain dry. Either of these conditions may exist in health, being dependent largely upon the weather, the food, etc. If urine is not passed for twelve hours, the condition should be reported.

The nurse may try to make the baby urinate by using fomentations over the bladder and kidneys before reporting the matter to the physician. If a baby cries when urinating, a careful examination must be made of the water-passage to see whether there is any cause for irritation, as the urine may be irritating. In boy babies there is sometimes a very long narrow fore-skin which tends to become adherent to the parts beneath it.

Phimosis is the name given this condition. For its management a nurse should be taught to retract the foreskin daily, oiling the surface beneath with a little castor-oil applied with a camel's hair brush or stick twisted with cotton. For irritating urine, giving the baby frequently a drink of cold water is usually sufficient.

Chafing.—The skin of new-born babies is soft and thin, and apt to become sore, especially when two surfaces rub. First, a little crack is noticed, next day this will have widened until, sometimes, a large surface is left bare. To prevent this, proper care of the baby from the very beginning is important. Never use soap. Use warm water in washing it, either plain warm water or water with sufficient powdered borax in it to make it soft, and wash the part very carefully; wipe or mop with a soft cloth until *thoroughly dry*. Then, to prevent further rubbing, carry a piece of dry sterilized gauze into the crease between the rubbed surfaces, separating them. This should be changed whenever the baby's napkin requires changing.

When the skin is broken, some healing ointment is generally required. The following has proved very satisfactory: An ointment consisting of two drams of bismuth subnitrate to the ounce of zinc ointment, or, preferably, lanolin. A paste of equal parts of bismuth subnitrate and castor-oil is also useful for the purpose.

Boils.—When run down or suffering from chronic

digestive troubles, babies often suffer from boils or other pustular eruptions. They may arise, too, from conditions of constitutional disease. When these need to be poulticed, the only kind of poultice admissible is an antiseptic poultice made by wringing out several folds of clean, soft, linen or gauze in a hot saturated solution of boric acid and covering this with a piece of rubber tissue or paraffin paper to retain the heat. A little ointment containing ichthyol is good in the early stage. When pus exists, the boil should be lanced. Change of air with tonics will often do much to relieve this tendency.

Fever Blisters.—Children should be kept from picking these blisters, which may be treated by the application two or three times a day of the bismuth and zinc ointment or any healing ointment.

Itch is a contagious skin affection, usually found among the dirty, but may be contracted by the cleanest children. The sides of the fingers, the toes, the buttocks, may be covered with small pimples and irregular ridges where the parasite has burrowed. There is intense itching. The thorough and careful use of antiseptics under the direction of a physician will be necessary for cure.

Ringworm is also a contagious skin affection due to a fungous growth. The ring-like shape gives it its name. Sulphur and tar ointment make a good application for this. Ringworm of the scalp is very difficult to cure, and should be seen by a doctor.

Baby's Sore Eyes.—There are two forms of inflamed eyes occurring in new-born infants; the first a simple catarrhal condition of no serious import; the other, a highly contagious, purulent inflammation of the conjunctival sack the result of infection by the organism of gonorrhea and termed ophthalmia neonatorum.

Ophthalmia Neonatorum usually manifests itself on the third or fourth day; the eyelids are swollen, edematous and tightly closed; from between them oozes thick, greenish-yellow pus; upon opening the lids the mucous membrane lining them is found intensely red, swollen and bathed with thick pus. The conjunctiva covering the eye-ball is next involved and even ulceration of the cornea may result; these ulcers in healing may leave scars which forever shut out "the blessed day light." Thirty out of every hundred cases of blindness are due to this preventable disease of infancy.

Ways of Infection.—1. If the mother is a victim of gonorrheal infection, the discharges bathing her vagina and vulva teem with gonococci which are deposited upon the child's lids during its birth. As soon as the child opens its eyes, this infectious material enters the conjunctival sac and the mischief is done.

2. The mother's or nurse's fingers may come in contact with infectious material about the vulva. If the infant's eyes are touched with these unclean hands, or if hands soiled with the mother's secretions are used about the child's face, infection promptly occurs.

3. In institutions, one unsuspected case of ophthalmia may lead to several others, the infection being carried from child to child by the nurse's hands.

Methods of Prevention.—Immediately after delivery, cleanse the eyes with a saturated solution of boric acid. Use pieces of old, soft linen; wipe from the inner angle of the eye to the outer and throw the cloth away, repeat several times and treat the opposite eye in like manner, being sure to attend to this before the child has a chance to open its eyes. This is something for the nurse to do, in all probability the doctor will be occupied with other matters but the nurse can concentrate her attention upon the child's eyes as soon as the head is born.

Credé's Prophylactic Disinfection.—Credé, in his lying-in hospital in Leipsic, succeeded in reducing the frequency of ophthalmia from 13 per cent. to 1 per cent. by instilling one drop of a 2 per cent. solution of silver nitrate in each eye immediately after the birth of the child. It is now universal practice to treat all hospital cases by this method as well as all suspicious cases in private practice.

Treatment.—Report immediately the presence of any discharge about a baby's eye. The doctor will at once make a smear and examine the discharge under the microscope. If gonococci are found, the child must be isolated with one or more conscientious nurses, the fate of the child's eyes rests in large measure with the nurse.

If there is one well eye, this must be sealed with cot-

ton and bandaged. Raise the bandage with disinfected hands and inspect this eye three times a day. Always lay the baby with the sore eye down. Douche the affected eye once every hour with a warm saturated solution of boric acid until free from pus. The best outfit for this purpose consists of a douche can, rubber tubing and bulbous tipped eye dropper. Place the baby on a table with its arms fastened to its sides and its head (sore eye down) on a Kelly pad. Gently separate the lids with the thumb and finger of one hand while the other hand holds the eye dropper and directs the flow from the inner to the outer angle of the eye.

In the intervals of douching, apply cold compresses to the lids. These are flat pads of absorbent cotton the size of a five-cent piece. Place a block of ice in a basin and arrange a goodly number of cotton balls upon it. The nurse seats herself comfortably at the child's head and places one compress on the lid, leaves it there one or two minutes then drops it in a pus pan and replaces it by a fresh pad. Keep this up without intermission for twenty minutes out of every hour.

Twice in twenty-four hours a 50 per cent. solution of argyrol may be ordered dropped in each eye. If ulceration of the cornea occurs, the pupil must be dilated with atropin.

Throughout the treatment of these cases the nurse is in imminent danger of infecting her own eyes. The greatest danger lies in the spattering of pus during the boric acid irrigation; throughout this process the nurse

must wear large spectacles or preferably automobile goggles which are provided with shields. While hand-



FIG. 61.—ARRANGEMENT FOR IRRIGATION OF THE EYES.

The pledget in the left hand is placed against the cheek to prevent the fluid from getting into the nostrils and mouth. (*De Lec.*)

ling the child, she should wear rubber gloves. Before touching her own eyes, making her toilet, or going to meals, her hands must be washed for ten minutes in

soap and water and disinfected for two minutes in bi-chlorid solution 1-10,000. If any pus accidentally reaches the nurse's eyes she must report to the physician immediately and not wait for symptoms to appear.

The poison is much more virulent in adults than in infants and many a valuable nurse has become permanently incapacitated through failure to carry out these precautions.

Upon discharge from isolation the room occupied by baby and nurse must be fumigated.

There is a law in many States, Pennsylvania included, requiring nurses or mothers having an infant in charge who is not under the care of a medical attendant to report promptly to the Board of Health any appearance of inflammation about the eyes.

Snuffles, or a Cold in the Head, shown by watery eyes, sneezing, stopping up of the nose, hence difficulty in nursing, should be managed by keeping the nose cleaned out by means of soft linen twisted into a cone, greasing the nose well afterward with a little oil by carrying it up the nostrils on a twist of cotton, greasing the outside of the nose between the eyes, and keeping the baby warm. If the baby has no hair, the head may be kept warm by a little mull (or in winter thin flannel) cap. Sometimes a little nitre-water or some tonic may be required. Usually a dose of oil should be given, as 10 minims castor-oil with 1/2 teaspoonful sweet oil at first, followed by warm drinks.

Running at the Ears is generally very serious in new-

born babies, especially when the discharge is matter or blood. Some trouble with the brain may be threatened, hence the physician should be told of it as soon as it is noticed. Of course, the discharge entering the ears at the time of the birth should be carefully excluded from this disorder.

Earache.—A persistent cry, with the raising of the hand constantly to the head, will often indicate earache. The pain is often relieved by holding a hot water bag or bottle to the ear. Relief is also often obtained by syringing the ear with water as hot as can be borne, after which a drop of warm oil or glycerine with or without a drop of laudanum may be dropped into the ear. This should be done frequently, and the ear kept covered in the intervals with hot, dry flannel.

The Breasts of new-born babies often swell. Generally this occurs about the seventh day or during the second week. Occasionally they gather, and must then be lanced by the physician. Nothing should be done for this swelling, except to see that the clothing is loose. It disappears in a few days, as a rule.

Scalp Tumors.—The same may be said of swellings on the head or about the face, which are due to pressure during the birth. One form of scalp tumor may last several weeks before its entire disappearance. The latter is the result of temporary injury to the bone, and not simply the ordinary swelling which comes from interference with the circulation of the blood in the soft tissues of this portion of the scalp. The name *blood-tumor*

(*hematoma*) is applied to this. No active treatment for its removal is necessary.

Deformities.—A child may be born with some deformity, as hare-lip, or cleft-palate, or club-foot, or extra fingers and toes, or there may be some malformation about the external organs of generation or the bowel. The bowel passage may be closed, or there may be no opening from the bladder. Whatever the deformity may be, the nurse should avoid letting the mother know anything about it until the physician has told her of it. The shock produced by the knowledge may do the mother much injury; hence the physician should bear the responsibility of making the announcement. A nurse will need considerable tact in managing this, as the mother is apt to ask to see her baby very soon after its birth. An excuse may be made by stating the necessity for washing and dressing the child first, or it may be asleep and the nurse hesitate to disturb it. A child with hare-lip or cleft-palate will need to be fed, as a rule, with the spoon or a dropper, as it cannot nurse.

Tongue-tie.—Quite frequently the bridle beneath the baby's tongue is too short, and interferes with the free movement of the tongue. This is called "tongue-tie." It may prevent the child's nursing, and thus interferes with its nutrition. If the baby can extend the tip of the tongue beyond its lips, it is not probable that there will need to be anything done, as the baby ought to be able to suck a good nipple with ease. If the nurse should introduce the tip of her little finger into the baby's

mouth and allow the child to draw on it for a few minutes, she can tell whether the act of sucking can be properly accomplished. Should it not be able to suck, the attention of the physician should be called to the matter, as the bridle will have to be nicked—an operation following which there may be considerable loss of blood, hence it should not be attempted except by a physician.

Bleeding from the Cord or navel string may occur within a few hours after birth. It may be that the cord has not been tied sufficiently tight, or there may have been a very thick cord, which, in shrinking, has loosened the ligature. If the cord has been tied in a single double bow-knot, this may be untied by the nurse and fastened more tightly, so that the bleeding may be controlled, or another ligature may be thrown around the cord a little nearer the body of the child than the first one. Should this not check the hemorrhage, the nurse should hold the cord firmly between the thumb and finger, making compression until the physician, who should be sent for, arrives.¹

Falling of Cord.—The cord commonly falls off about the fifth day. The process of ulceration, by which it falls off, leaves an open surface on the child's body which offers an avenue for *septic infection*. Great care should therefore be taken that the nurse's hands and

¹Bleeding from the base of the stump after the cord has fallen is a more difficult condition to manage. The physician needs sometimes to control the hemorrhage by a ligature drawn beneath transfixion pins. The nurse must keep up pressure over the site until the doctor comes. If this is a simple oozing, a free application of powdered tannic acid with a compress is all that is necessary.

anything else that comes in contact with this surface are perfectly clean. Should any moisture exist about the stump, the use of the antiseptic powder of salicylic acid and starch, before spoken of, or some other drying powder of the kind, may prove useful. It is necessary, also, to see that the dressing used is thoroughly antiseptic. When infection does exist, it shows itself in the occurrence of inflammation around the navel or some other part of the body; the child loses flesh, has fever, becomes puny and emaciated, and abscesses form in various places. In the majority of cases it dies, not having sufficient vitality to survive the poisoning.¹

The physician will, of course, prescribe the treatment for such a child; the nurse will be required to see that these directions are faithfully carried out, and especially that the child gets the nourishment and stimulation required.

Umbilical Vegetations are either soft, jelly-like growths, or, what is more common, hard protuberances sometimes the size of a hickory-nut. They are not painful and seldom bleed. The physician sometimes removes them by ligature. The softer forms may be touched with caustic and thus made to shrink. When an ulcer exists at the place from which the cord dropped, dry antiseptic dressings or a drying powder, as boric acid and zinc oxide or a little tannic acid powder should be kept applied.

Jaundice.—A peculiar yellowish coloration of the skin

¹ Sometimes the inflammation takes on the character of erysipelas.

is to be noticed with babies a few days after the birth. This disappears, as a rule, by the end of the second week and is due to changes in the circulation.

Should the jaundice be very marked and seem to persist, warm baths once or twice a day, with gentle friction over the liver with soap liniment, helps, with free action of the bowels, to overcome the condition. Jaundice of the new-born baby is sometimes the result of disease of the liver. The color is then very marked. The baby grows thin rapidly and appears sick. The stools are apt to be clay-colored. When the child is suffering from blood-poisoning, the peculiar coloration of the skin is due to this cause.

Buhl's Disease and Winckel's Disease are obscure conditions in new-born babies, thought to be due to fatty degeneration of the internal organs. They result fatally, as a rule, within the first few days of life. There is a tendency to hemorrhage from various parts of the body.

Bleeders.—In some families, known as “bleeders,” the tendency to hemorrhage may be transmitted to the child, particularly if it be a boy. It is necessary to watch for any such tendency very closely. The hemorrhages may occur from any open surface on the body, or from the mucous surfaces. Tarry stools occurring after the normal bowel passages have been established would be an indication of intestinal hemorrhage. Sometimes the hemorrhage is in the brain and the child dies with symptoms of brain trouble.

Convulsions may occur in very young infants at varying periods after their birth, according to the cause which excites them, as injury during labor, indigestion, brain trouble, or other causes. The convulsive seizure is generally preceded by twitching of the limbs, a rolling up of the eyeballs, so that a large part of the whites of the eyes is seen, the thumbs are drawn into the palms of the hands, and the fingers tightly clasped over them, or the toes may be turned upward or drawn downward. During the convulsion the child grows rigid.

When the attack comes on the nurse should quickly undress the child and place it in a warm bath. A tablespoonful of mustard added to the water will help to stimulate the skin, and the convulsion will gradually subside. The child, on its removal from the bath, may be wrapped in a heated blanket, and allowed to perspire freely. On the recurrence of the convulsion, the same measure of placing the child in the bath should be resorted to, until the physician comes and institutes such other treatment as he may think proper. The use of an ounce of milk of asafetida by bowel is often efficient in quieting nervous irritability.

Bruises, the result of falls or blows, should be treated by the repeated application of hot or cold compresses. This will relieve pain and prevent swelling and the black and blue discoloration of the skin which would otherwise result.

The occurrence of a fall or blow should always be at once reported by a nurse, as the child should be carefully

examined for the discovery of any injury the serious consequences of which may be averted by prompt treatment. The occurrence of paleness or vomiting after any such accident is a serious symptom, and should receive immediate attention by the physician.

Fever.—A hot, dry skin may accompany various of the disorders of infancy, notably inflammatory conditions of the digestive organs and of the lungs. The normal temperature of a new-born baby is 99° Fahr., the pulse 140, the respiration 44.

Should the child seem to be ailing, its temperature should be taken. A clinical thermometer may be held the requisite number of minutes in the groin or in the folds of the neck. Some slip the bulb of the thermometer into the rectum. Should the temperature be raised, the pulse rapid, and the respiration hurried and difficult, some *lung trouble* probably exists. Pneumonia is a very common disease with infants. A catch in the breath, noisy breathing, a distention of the nostrils on taking an inspiration, would indicate the same thing. The frequent rubbing of the chest with some counter-irritant liniment, as Compound Camphor liniment, the use of the cotton-jacket for the protection of the chest, and, if the child is very feverish, sponging it frequently with tepid water, and the use of a drop of sweet spirits of niter in a teaspoonful of cold water once in two hours or oftener, will constitute the nurse's management of the case until the doctor has seen the baby and laid down his plan of treatment. The *cotton-jacket* is made by tak-

ing a high-necked, long-sleeved merino vest a size or two larger than would be needed by the baby for ordinary wear, opening it down the front, and fastening tapes an inch or two from each edge in front, by which the jacket may be closed. The inner surface of this vest, back and front, should be quilted with sheep's wool or cotton batting, the outer surface with oiled silk or oiled muslin. This makes a very warm covering for the chest. Some physicians employ compresses wrung out in cold water underneath the lined vest, renewing them frequently; others prefer using warm flaxseed poultices.

Infectious Diseases, such as scarlet fever, measles, etc., are very rare under the age of one year, especially under six months, therefore do not need to be considered here. Occasionally when the mother has the affection or has been where these diseases are immediately before or at the time of the baby's birth, the child will have the disease or develop it. The treatment must be managed by a physician.

Cyanosis, or "blue disease," comes from the imperfect closure of an opening which exists in the heart before birth. The baby is called a "blue baby," and is very delicate in consequence of this imperfection in its circulation. Such babies generally die, if not during infancy, some time during early childhood. With great care they sometimes live, and the opening in the heart gradually closes up. The special care required is to keep the child warm and to handle it very carefully, so that it may be subjected to no jar or nervous fright.

The child should be kept lying on its right side, or on its back, in order that there may be as little interference as possible with the action of the heart, and that the tendency of the blood to flow through this opening in the upper chambers of the heart—from right to left—may be overcome.

Rickets is a disease of the bones—the result of poor nutrition. There is not sufficient deposit of earthy matter in the bones, hence they remain too soft and are subject to all kinds of distortions in consequence of this. The child may be bow-legged and is stunted in its growth curvatures of the spine may exist, or an unnaturally large head, known as hydrocephalus, or “water on the brain.”

Scrofula is a term applied to a form of tuberculosis common among children. It shows itself in the tendency to enlargement of the glands, especially of the neck—the occurrence of abscesses and sore and weak eyes. Such cases should always be under the care of a physician.

Marasmus is a term used to indicate a condition of persistent wasting in a child from whatever cause. The child becomes excessively thin, the skin yellowish, the face wrinkled. Tuberculosis, syphilis, persistent diarrhea, and vomiting are apt to produce it.

The baby having this disease is very weak, cannot hold up its head well, perspires very freely, especially about the head. The complexion is very white. The baby has constant trouble with its bowels, having green

stools nearly all the time. The opening in the front of the head is depressed and the child seems to waste.

As the baby grows older, unless well cared for, the evidences of disease increase, the joints are enlarged, the baby cannot support itself on its limbs, its teeth are slow in coming, etc.

The mother can do much for the health of her child, while still carrying it, by a careful regard for her own general health. After the baby's birth it should be kept well nourished, to overcome any tendency to disease. Salt baths, oil baths, and the use of tonics ordered by the physician, as cod-liver oil, together with careful attention to the quality and quantity of nourishment, will do much to prevent the progress of any wasting disease.

Water on the Brain, or Hydrocephalus.—An enlargement of the head is sometimes found even with very young infants, due to an accumulation of fluid within the skull, which results from a form of chronic inflammation. In mild cases the mind is not affected, and the child seems to outgrow the condition.

Paralysis of one side of the face or of an arm sometimes results from pressure during the birth. The baby usually recovers from this in a few weeks. Another form of paralysis sometimes occurs with infants which is due to disease of the spinal cord. These cases require intelligent medical supervision.

Vaccination.—The question often arises as to how early a baby should be vaccinated, particularly if small-pox be prevalent. As a matter of experience, it is

found that the vaccination does not "take" well before the third month, though if a younger baby is to be exposed to the poison, it would be well to have it vaccinated. Vaccination should be avoided, if possible, when the baby's health is run down from any cause, also at the time of teething. A peculiar and distressing form of rash sometimes occurs, or there is a great deal of inflammation following the vaccination, leading the parents to imagine that the baby has been poisoned by the virus used.

Care should be taken to see that the child does not scratch the sore, and that it is kept free from the rubbing of the clothing. No grease should be applied unless directed by the physician. When there is much redness and intense itching the physician may direct some powder or ointment to be applied to allay this.

A soft, clean, linen handkerchief can be bound over the sore, and a loose-sleeved garment used to prevent the irritation of rubbing. Applications which are not aseptic, when used about such a sore may induce blood poisoning.

An insight into the frailty of human life in its earliest days proves how much the world owes to the faithfulness of mothers and nurses, and should be a stimulus to scientific research in the discovery of improved methods for the management of infancy.

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